AUSTRALIAN BUSINESS COMPUTER

$2·95

16-BIT OLIVETTI BENCHTESTED

INTRODUCTION TO DATABASES

CANON CX·1 MICRO BENCHTESTED

PERSONALLY... IT HAS TO BE NEC

NEC's desktop Personal Computers are a sophisticated and practical solution for any business that needs a personal support system.

They're designed for absolute reliability and built by NEC to the highest technical standards.

The APC (Advanced Personal Computer) is our revolutionary new desktop, just released in Australia.

Its integrated storage capacity (2MBytes) makes it the micro-computer that's best suited to a real desktop business environment.

The true 16-bit capability of its 8086 processor makes it the most powerful machine in its class.

The APC's high-resolution colour graphics (640 x 475 pixels) run circles, arcs and lines around everybody else, and its screen images set new standards in clarity.

Our business software has been optimised to match the APC's unique hardware features and capacity.

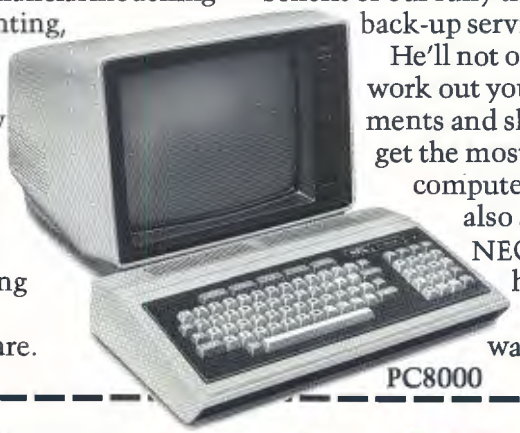
The wide range of software applications include business planning, budget analysis and all types of general accounting. There's also a remote intelligent terminal operation with asynchronous or bi-synchronous (3270, 3780) communications capability. All this from under $5,000 recommended retail price, including tax.

Both CP/M-86 and MS-DOS operating systems are supported by the APC, to solve business problems in the simplest, most cost-effective way possible.

APC

The PC8000 desktop personal computer is our 8-bit little brother to the APC. It's ideal for financial modelling and general accounting, and has the same intelligent remote terminal capability as its big brother.

The PC8000 supports industry standard CP/M-80 and N-BASIC, giving it a wide range of applications software.


PC8000

When you install an APC or PC8000 computer you will also get the benefit of our fully trained dealer back-up service.

He'll not only help you work out your exact requirements and show you how to get the most out of your computer system, he'll also show you how NEC stands behind him in the provision of hardware maintenance.

Please send further information about the ☐ APC ☐ PC8000 including a list of authorised NEC dealers.

NEC Information Systems Australia Pty Ltd, 99 Nicholson Street, St. Leonards 2065. Telephone: 438 3544.

NEC

TOKYO JAPAN

Name: _____

Address: _____

_____ Postcode: _____

NEC 526.

NEC

TOKYO/JAPAN

PERSONAL COMPUTER SOFTWARE AND AUTHORISED DEALERS

SOFTWARE

Category A:
Software sold by NECISA as the sole distributor of these packages on NEC personal computers. Full support provided by NECISA.

Category B:
Third party software with which NECISA is familiar and has demonstrated and tested and for which first line support may be obtainable from NECISA, but no warranty is implied. Product is obtainable from author or under certain circumstances, via NECISA.

Category C:
Third party software which is claimed to run on NEC Personal Computer products but which NECISA has not, as yet, fully evaluated.

8-BIT SOFTWARE AVAILABLE FOR PC8000 PERSONAL COMPUTER

Operating Systems

CP/M-80 V2.2	(A)

Languages

NBASIC	(A)

Telecommunications

I.E. Bisync – 80/3270	(A)
I.E. Bisync – 80/3780	(A)
I.E./Modem (Asynch)	(A)

Word Processing

Benchmark	
Word Processor	(A)
Benchmark	
Mail List Manager	(A)
Bench mark	
Telecommunicator	(A)
Wordstar	(B)
Mailmerge	(C)
Spellstar	(C)

Data Management

dBASE II	(A)
Datastar	(C)
SuperSort	(C)
Caxton Cardbox	(C)

Financial Modelling

Calcstar	(C)
Micromodeller	(B)
Multiplan	(C)

Accounting

Padmede	(B)
Challenge	(C)
I.M.S.	(C)

16-BIT SOFTWARE AVAILABLE FOR ADVANCED PERSONAL COMPUTER

Operating Systems

CP/M-86	(A)
MS-DOS	(A)

Languages

R.M. COBOL	(A)
C/BASIC-86	(B)
PASCAL MT+/86	(B)

Telecommunications

I.E. Asynch – 86	(A)
I.E. Bisync – 80/3780	(A)
I.E. Bisync – 80/3270	(A)
I.E. Bisync – 86/HASP	(A)

Word Processing

Benchmark	
Word Processor	(A)
Benchmark	
Telecommunicator	(A)
Benchmark	
Mail List Manager	(A)

Data Management

dBASE II	(A)

Financial Modelling

Microplan Spreadsheet	(A)
Microplan	
Business Planner	(A)
Microplan	
Consolidator	(A)

Accounting

IMS (Ascent)	(C)
Compact	(C)

AUTHORISED DEALERS

NSW

SMITH AND LANE MANAGEMENT
SYDNEY
2nd Floor
51 Bathurst Street
Phone: (02) 264 7651

OFFICE UPDATES COMPUTER SUPPLIERS
SYDNEY
45 Erskin Street
Phone: (02) 29 1991

L.S.T. ELECTRONICS
TAMWORTH
Suite 1-7,
11 Fitzroy Street
Phone: (067) 66 3162

BISPLAN CONSULTING SERVICES
CHATSWOOD
2nd Floor
10 Help Street
Phone: (02) 419 7822

COMPU-K
SOUTH LISMORE
7 Casino Street
Phone: (066) 21 8180

COMPUTE CBM SYSTEMS
CAMINGBAH
Suite 5, 2nd Floor
38 President Avenue
Phone: (02) 525 5022

COMPUTER GALERIE
NORTH SYDNEY
66 Walker Street
Phone: (02) 929 5497

INTELLIGENCE
SYDNEY
4th Floor
204 Clarence Street
Phone: (02) 29 5431

CHALLENGE COMPUTERS AUSTRALIA PTY. LTD.
NORTH SYDNEY
66 Berry Street
Phone: (02) 437 4322

CYBERNETICS RESEARCH SYSTEMS CONSULTANTS
REDFERN
120 Lawson Street
Phone: (02) 698 8286

VIC

DEDICATED MICRO SYSTEMS
CANTERBURY
173 Canterbury Road
Phone: (03) 836 9270

PEDERSEN COMPUTER SYSTEMS
BAYSWATER
8 Scroesby Road
Phone: (03) 729 4366

WILKINSON COMPUTERS PTY. LTD.
CAMBERWELL
757 Riverdale Road
Phone: (03) 836 7692

ASHLEY COMPUTER SERVICES
MORNINGTON
12 Liwnett Court
Phone: (059) 75 1239

IMC
INFORMATION MANAGEMENT CONSULTANTS PTY. LTD.
HAWTHORN
9 Church Street
Phone: (03) 861 5637

DATA PARTS
SHEPPARTON
11 Edwards Street
Phone: (058) 21 7155

D.D. WEBSTER ELECTRONICS
BAYSWATER
17 Malvern Street
Phone: (03) 729 8444

ENTERCOM COMPUTER CO.
RICHMOND
136 Bridge Street
Phone: (03) 429 5883

FLEET MANAGEMENT SYSTEMS PTY. LTD.
CAMBERWELL
Suite 4,
493 Riversdale Road
Phone: (03) 82 7512

SA

DOLLING ASSOCIATED CASH REGISTER
HAMPSTEAD GARDENS
307 North East Road
Phone: (08) 261 4166

COPIA BUSINESS MACHINES
ADELAIDE
247 Morphett Street
Phone: (081) 516300

WA

COMPUTER COUNTRY HOLDINGS
OSBORNE PARK
128 Hector Street
Phone: (09) 444 7431

GORDON HOWARD AND ASSOCIATES
LEEDERVILLE
616 Newcastle Street
Phone: (09) 328 8033

QLD

CAIRNS COMPUTER CENTRE
WESTCOURT
8 Jones Street
Phone: (070) 51 5902

M.D. RESEARCH
WOODY POINT
21 View Street
Phone: (07) 284 2357

MICRONIX
WINDSOR
11 Blackmore Street
Phone: (07) 57 4806

TAS

QUANTUM ELECTRONICS PTY. LTD.
ELECTRONIC MANUFACTURERS
HOBART
Cnr. Liverpool and Harrington Sts
Phone: (002) 34 3051

PC 8000

CONTENTS

Volume 2 Number 1 1983 Registered for Posting as a Publication Category B. Recommended Retail Price only.

Managing Editor
Sean Howard

Consultant Editor
Peter Smith

Art Director
Mike Northcott

Typesetter
Marcia Brown

Advertising Manager
Gerard Kohne

Subscriptions Manager
Valerie Meagher

Printed by
Lewis Printing

Subscription rates
Australia $30.00 per annum
Overseas A$40.00 (surface)
A$100 (airmail)

Published by
Sean Howard Productions
3/500 Clayton Road,
Clayton, Vic. 3168.
Telephone (03) 544 8855
Telex AA 30333 AMJ

Material contained within *Australian Business Computer* is protected by the Commonwealth Copyright Act 1968. No material may be reproduced in part or whole without written consent from the copyright holders.

This magazine is produced under an agreement with Felden Productions.

REGULARS

20 **IN THE BEGINNING**
Lisa Clayton takes you down the path to computer literacy.

39 **GOLDSWORTHY**
Australia, 'The Lucky Country'.

47 **SUBSCRIPTIONS**
Now is the time.

59 **READER SURVEY**
The chance for you to have your say.

75 **NEW BUYERS**
A checklist and suggested method to help you approach your purchase of hardware.

76 **MICRO MARKET**
Bi-monthly listing of what's available.

FEATURES

24 **CLEARING AWAY THE JARGON**
What to say when you're trying to get the message across.

28 **DATA BASE INTRODUCTION**
What they are and what they do.

33 **SHOW PREVIEW**
What's in store at the 1st Australian Personal Computer Show.

34 **GETTING PERSONAL**
John Thompson of Prime (Australia) gets Personal.

36 **CHECKOUT: SUPERCALC – FIGURING IT OUT**
Charles Christian checks out SuperCalc on the Osborne 1.

42 **SOFTWARE CHECKOUT**
Alec Glover reviews 'Cash Flow System', a small systems software package to monitor cash flow.

48 **PROGRAM PIRACY**
Is the cost of software protection worth the trouble and cost it takes?

62 **NEW COMPUTING: MICROS IN MAINFRAME COMPANY**
Alan Wood in Part 3 gets to grips with the micro revolution and its influence in mainframe computer installations.

NEWS

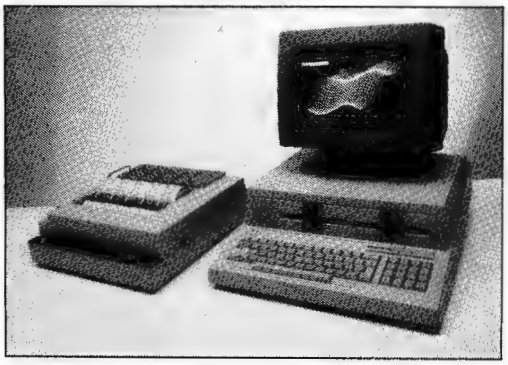
4 **THE WORLD**
The latest from around the world.

7 **AUSTRALIA**
What is and isn't happening at home.

61 **MICRO TROUBLES**
A special news item detailing the changing strategy of retailing microcomputers in the US.

BENCHTESTS

10 **BENCHTEST: OLIVETTI M20**
Olivetti's contribution to the world of 16-bit computing.



52 **DATA BASE BENCHTEST**
Kathy Lang investigates Personal Pearl.

63 **BENCHTEST: CANON CX–1**
Robin Webster takes a peek inside this idiosyncratic business machine.

ADVERTISERS INDEX

Abacus 34
Ampec. 14,25,OBC
Anderson Digital Equipment 19
The Australian Beginning . . .60
Australian Exhibition Services. 30,31
Automation Stratham. 33
Barter Network 43,45
Burroughs 27
Canon Australia. 63
The Computer Company. 66,67
Computer Imports. 5
Continuity Media Supplies . .51
Dicker Data Projects 23
Elmasco Instruments. 64
Fagan Microcomputer Systems. 54,55
Hewlett Packard 49
Imagineering 15
Intelligent Terminals. 9,41
Kenelec Australia 40
Leroy Data 38
Micro Ink 46
NECISA 1,IFC
OCE Reprographics. 58
QT Computer Systems 22
Rank Xerox. 17,21
Software Solutions 79
Tandy Electronics. . . . . .IBC
Verbatim. 80
Warburton Franki 56

Casio micro offers CP/M for business

Casio has added two models to its series of office microcomputers, the FP-5700 Model 38 and Model 48.

Both are equipped with twin 8-inch floppy disk drives and differ chiefly in the memory capacity – 229 Kbytes for the Model 38 and 262 Kbytes for the Model 48. The user area in RAM is 100 Kbytes for both machines.

Three 8-bit processors are used; two Z80s for data processing and I/O respectively and another 8-bit microprocessor to handle the keyboard. This is said to increase the processing speed considerably.

IEEE-488 and RS232C interfaces are provided as standard. A kanji (Chinese character) board is optional and allows kanji characters to be displayed and printed.

The software supplied is CP/M and CB Basic plus a program generator called Fpel. Code free languages such as Fpel (pronounced 'efpel') and Sord's Pips are becoming almost ubiquitous with Japanese made micros aimed at the office market. This reflects the fact that there is relatively little off the shelf software in Japan. The availability of these business-oriented languages is seen as helping to penetrate the highly competitive Japanese market.

The Model 38 costs Y748,000 ($3200) and the Model 48 is Y898,000 ($3900).

Sony sells at home after US trial

The Sony SMC-70 8-bit microcomputer is now on sale in Japan. Sony broke with the Japanese tradition by launching the SMC-70 in the United States first. It was announced last May and started selling there in October.

The SMC-70 is an unusual micro. It was designed primarily to compete with the Apple, but differs in having a whole range of Sony made peripherals. The peripherals plug into the back of the unit which slides back to accommodate them.

Although the usual marketing strategy is to iron the bugs out in the domestic market first, Sony tends to sell abroad first, sometimes at the expense of the Japanese market.

The American price of the SMC-70 is $1475 (designed to compete with an 80-column Apple) but in Japan it sells for Y228,000 ($980 at the current rate of exchange). Sony expects the average system price in Japan to be Y400,000 ($1725).

A wide range of peripherals already exists and more are planned. The range includes Sony micro-floppy drives, a battery back-up pack, an IEEE-488 interface, an interface for five inch and eight inch disk drives, a Kanji (Chinese character) conversion kit and a 16-bit upgrade based on the 7086 CPU.

The SMC-70 is supplied with 64 Kbytes of user RAM, 32 Kbytes of graphics RAM and 6 Kbytes of character display memory. A 48 Kbyte ROM contains a system monitor and a version of Basic written by Sony. There appears to be little or no software available.

Sony has chosen two different routes for the domestic distribution of the SMC-70: ordinary high street electrical shops and specialist computer retail outlets.

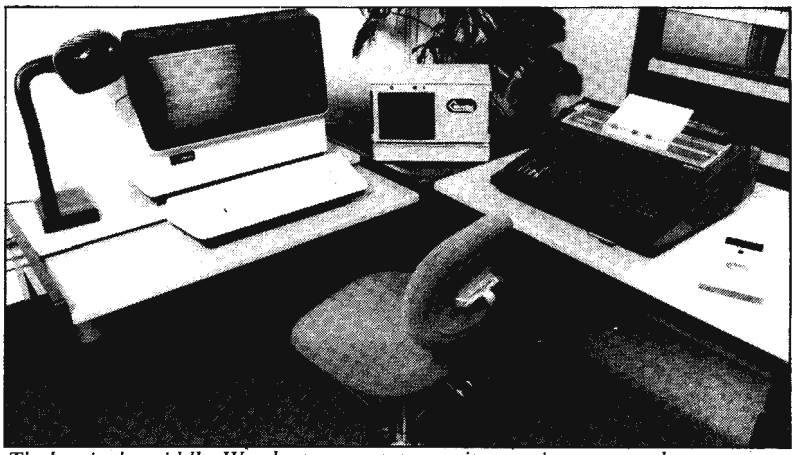
The Japanese price of the SMC-70 is $563 lower than in the United States. This reflects the severe competition the model faces from the batch of new microcomputers flooding into the market from makers such as Toshiba, NEC and Fujitsu. Even so, Sony is anticipating large sales. Current production plans are based on the experience in America where 60 retail outlets are said to be selling 1000 units a month. Sony also expects to sell 1000 units a month in Japan over the next year, generating $20 million in sales.

Sony anticipates the market for the SMC-70 growing sufficiently to set its production target at 100,000 units a year "in two years or so".

Wordnet links the micro and typist

A new company called Wordnet is about to launch a system that will link up to eight golfball or electronic typewriters into a word processor or CP/M micro, for use as concurrent data input terminals.

Wordnet claims that most 'information processing' terminals – meaning the word processor or micro itself in single-user systems – are used for data input 80 per cent of the time. The Wordnet 2000 system downloads this task to typewriters, and frees the terminal to get on with processing the data.



The box in the middle, Wordnet, corrects typewriter to micros or word processors.

Wordnet 2000 is basically a box that sits between the micro or word processor and the cluster of typewriters, managing the flow of data through the system. It is a computer in its own right, with a Z80 processor, 34 Kbyte of RAM, and up to four 720 Kbyte floppy disk drives, that runs a CP/M compatible operating system called ZOS-80 to drive the network.

On the back are eight multiplexed 20mA current loop interfaces and three 6232C serial ports, with the current loops connecting to the typewriters through module line feeders. Each line feeder has its own Z80 and a six circuit display, as well as the current loop port, one parallel port, and one RS232 interface.

Obviously the typewriters need to

have some kind of output data port, but there is a wide range of these available now. Wordnet claims that machines from Adler, Brother, IBM, Olivetti, Olympia and Remington – all big names – can be plugged into Wordnet 2000.

And the Wordnet box can be in turn connected to any CP/M micro, any of the big-name dedicated word processors, photo-typesetters, and any large computer system using standard teletype communications.

In operation, the typists simply type data or documents for word processing as usual. This is collected by the Wordnet box, stored on the local disk drives, and then transferred to the data processing machine. The data or documents can then be manipulated on the screen as required.

Wordnet claims that this is a cheap way to spread information processing around an organisation, using existing typewriters instead of having to buy a computer terminal to replace each one. The price will not be released until the official launch, but the company says that under normal leasing arrangements it will cost $7 per typewriter per week.

MINIS LOSING OUT

The micro market has burst the minicomputer bubble, figures just released in America show.

Research company Frost and Sullivan predicts, in a report on the minicomputer hardware market, that the US minicomputer business "will advance from $4.7 billion in 1981 to $12.5 billion by 1986, in constant 1982 dollars."

This growth, says Frost and Sullivan, while "impressive", falls far short of many predictions made as recently as two years ago.

"This drastic slowing of growth can be attributed to a number of factors – primarily the current economic slump and concommittant high interest rates, but also the availability of microcomputer systems capable of competing with minicomputers at far lower price levels," says the report.

A minicomputer is a system costing around $90,000, according to the company and it predicts that this definition will remain valid even if technology advances.

"Capacities of microcomputers – the fastest growing segment – can be expected to continue to grow," says the report. "Systems with 32-bit architecture will soon be competing with the traditional eight-bit and 16-bit systems – providing more impressive price/performance ratios at the bottom of the market." And as micros get more powerful, the report says, they will undermine more and more minicomputer applications.

The study added that user problems in minicomputers were approaching the level encountered in micro systems.

A Frost and Sullivan survey of end users indicated "a significant level of dissatisfaction with the quality of service, and especially support." This is a state of affairs "which one might more likely expect to find in the microcomputer industry," adds the company rather naively.

The figures put in context the urgency with which Digital Equipment must approach the microcomputer market, since it is, by an enormous margin, the largest minicomputer supplier.

Digital has around 30 per cent of the total US market, followed at some distance by Hewlett-Packard with only 11.6 per cent, Data General marginally behind that at 11.4 per cent, IBM some way after in fourth position (6.8 per cent) and Wang, nearly as big in this area, with a surprising 6.6. per cent.

REPORT POURS COLD WATER ON MICRO SALES ABILITY

Dealers and retailers of microcomputers could be wasting their time

LOOK

Peripherals and Interfaces for

* IBM PC – RAM Card etc.
* APPLE – 8086 Card (runs IBM Software) Z80 Card, Centronics Card etc.
* TANDY – Disk Controller Card, Serial Card, CP/M Card, 80 Col. Card etc.
* VIC-20 – A to D Card, D to A Card, Serial Card etc.

ALSO

* PRINTERS – ITOH, CASE, FUJITSU, PRISM, ANADEX
* DISK DRIVES – YE DATA, MPI, SIEMENS

COMPUTER IMPORTS

180 GOUGER STREET, ADELAIDE, S.A.

All Correspondence to:
G.P.O. BOX 1880, ADELAIDE, S.A. 5001

TELEPHONE: (08) 211 8146

trying to sell micros to a great many important volume markets according to a new report by the market research organisation Romtec.

"Dealers and retailers, as they presently exhibit the state of the art, do not inspire sufficient confidence to be trusted with the execution of volume sales to businessmen. Mail order is out of the question for microcomputer business systems," says Romtec.

"Potential customers encountered in this survey prefer systems houses, complete bureaux and a client sales force as the medium for supply. Direct sales forces will do well to sell large order quantities and work jointly with established non-computer suppliers to target markets.

The exhaustive new report out this week gives a breakdown of the opportunities that exist to sell micros in 35 different markets. The report analyses the chances for micro dealers and manufacturers to break into such sectors as: restaurants, hotels, garages, estate agents, accountants, solicitors, printers, newsagents and off licences among many other fields.

However, the news isn't all good. Many of these industries, reports Romtec, are not receptive to the idea of computerising their businesses.

Restaurant owners, for example, tend to feel that the use of micros "would distract from the service element without providing real savings or benefits". Romtec further adds: "No significant investment plans are apparent from our small sample for smaller catering establishments to install microcomputers."

Romtec urges companies developing microcomputer business systems to avoid the pitfall of developing a system just for the client in the hope that the system can be sold to other clients. "It is essential that targeted markets are researched on a broad base first. In this way a specification can be established which has inherent volume potential."

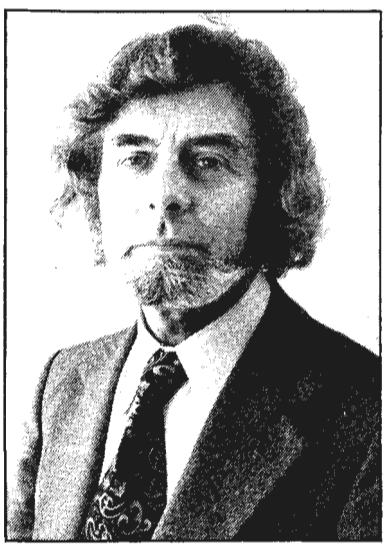
Romtec's advice is to "develop a prototype for test marketing in order to gain the confidence required for the first release, set up user groups and control further releases extremely firmly. Avoid 'specials' like the plague. They're rarely profitable.

Volume Market Opportunities for Business Micro Computers from Romtec, 75/7 Victoria Street, Windsor, Berkshire SL4 1EH. Tel: 07535 51550.

One step beyond for Systematix pack

A British software company has gone one step beyond "The Last One" and is producing a program that not only writes programs, but analyses systems.

The new product, called Systematix, is being developed at F International, a software consultancy in Berkhamstead, under the direction of Urwick Dynamics director Kit Grindley.



Kit Grindley: directing the development.

"We will not be selling the product to end users," said Andrew Bone, who is developing the software on a Commodore Pet at F International. "The project is a joint venture between directors of F International and other partners including Kit Grindley, and the idea is to actually produce better software."

The backers of Systematix hope that the program will help them break the cost barrier of tailored software.

"People put up with standard micro packages because they have to," said Steve Shirley, F International head. "But if they could get them to do exactly what they want, for the same sort of cost, then they would never buy another package."

Systematix is not intended to be able to compete with the typical cost of standard software expected in two to five years' time, when most best-selling programs will cost under $200, and many under $50.

"At the moment, it is part of our service," said Bone. "We provide tailor-made solutions, and use Systematix to make sure that we ask the user the right questions."

The concept is one which Grindley is well known for in more academic computing circles, but which has not before been translated into "hard" software. "It is more flexible than existing integrated software packages – for example, we think it is more flexible than either Silicon Office or DMS, both of which run on this Pet," said Bone.

The plan is to release the code onto the market one day, "when we've used it ourselves for a year or so, and have tuned it up."

Some trial projects have been done; typically they have proved to need between two weeks and four weeks from start to finish - producing an "integrated" system for around $2000.

NZ JETBET GOES LIVE

Alexandra Park, Auckland, saw the New Zealand Totalisator Agency Board's new JETBET integrated on-course and off-course betting system go live on-course for the first time recently. It was the latest stage in implementing the second biggest on line computer network in Australasia.

The NZ TAB's planned network will be second only to Databank in terms of both size and number of simultaneous transactions and users.

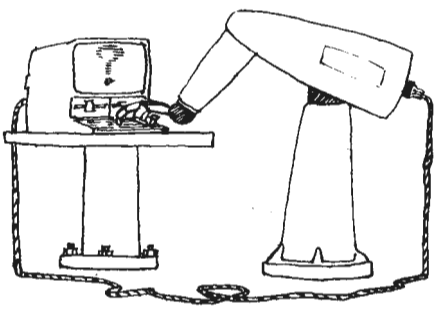
This latest stage of the nationwide computing network which began mid November brings into the JETBET system racecourses in the Auckland region. It was under control of dual Perkin-Elmer 32-bit Megamini computers mounted in a mobile data processing transport.

The Perkin-Elmer computers are at the heart of the new JETBET system with inter track betting and multiple bets on the same ticket.

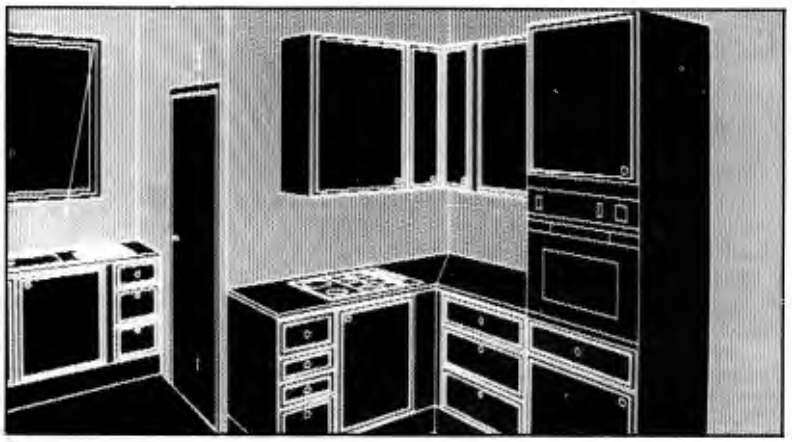
All racing clubs in New Zealand are to be connected with the computerised network which provides them on-course computerised sell/pay totalisator services integrated with off-course, allowing for the inter track betting and payout.

Dayan also stresses the importance of the Perkin-Elmer Computers being able to address up to 16 megabytes of main memory.

Twenty of the Perkin-Elmer computers will be incorporated into the network. They will interface with slightly over 2000 betting terminals both on-course and off-course.



Tapping potential of Sirius' display



Graphics Toolkit can help design a room in plan and show it in perspective.

One of the several highly attractive features of the Sirius 1 is the extremely high resolution display. As many owners have discovered, however, it is very difficult indeed to tap the graphics potential of the machine from MBasic and none of the initially released software has made any use of hi-res graphics.

All of that is about to change now that Barson Computers has announced the imminent availability of a Graphics Toolkit for the Sirius. This contains eight modules which enable one to create high resolution graphics screens, store them on disk and dump them onto a printer. Part of the Toolkit is Microsoft's new GW Basic which has the ability to support all of Sirius' tricky hardware features built into it, including sound and graphics. Programmers will be delighted to hear that it has a full screen editor built in as well.

Part of the kit is a program called BUSIGRAF which allows the easy development of business organisation charts. A novel feature called Slide Maker allows a number of these charts to be stored on disk and displayed in sequence, effectively turning the Sirius into a slideshow for business presentation.

The ability to create new character sets is fully utilised for the first time via the program EFONT and the keyboard can now be redefined at will by using KEYGEN. Once software houses get hold of the Graphics Toolkit we can expect to see products that exploit the powerful features of Sirius to the full; perhaps a word processor with proportional spacing and various type styles?

The Graphics Toolkit costs around $310. It requires a Sirius with a minimum of 256K RAM though.

Other important software releases from Barson Computers are three communications packages for Sirius. ASYNCH provides terminal emulation so that Sirius can be a dumb or intelligent terminal to a mainframe or minicomputer (around $210). The 3270 package allows Sirius to imitate one of the IBM 3270 series of displays and printers so that it can be used in distributed data processing setups (around $650).

Finally Remove Batch (around $540) can transmit and receive data in files or from the keyboard using the IBM bisynchronous protocol (with automatic translation between EBCDIC and ASCII). This means that a Sirius operator can perform remote job entry via a dial-up or leased telephone link to a bureau service.

GOOD TIME

Australian manufacturer Electronic Control Systems announced recently at an Opera House function the E-LAN network concept.

E-LAN is a network of office microcomputers connected by a high speed co-axial cable to form a unified multistation system ideally suited to office automation.

The fundamental philosophy is: "Each user's computing function is performed within the station at which he operates."

A group of E-LAN stations in an office interact frequently with each other and when necessary with a remote computer system . . . users become self-reliant and self educating with modern non-procedural software tools while existing EDP standards are maintained by central EDP staff via the mainframe connection.

Because E-LAN is a complete, self-contained system it also may be operated totally independently of a central computer and is therefore particularly suited to providing all the electronic office services required by any business or government department.

E-LAN stations can have Winchester disks, floppy disks or just semiconductor memory storage. With or without integrated disk storage any station can instantly assume any E-LAN functions such as data entry or financial planning by loading these programs from any other station on the network. EON network operating software automatically retrieves the desired function or file, typically in less than one second, while ensuring that house keeping is performed unobtrusively in the background.

Advanced E-LAN functions include electronic mail, diary and task/project management plus file security through date and time marking and access permissions.

Telex facilities at every E-LAN station introduce a whole new technique for business communications and bring new levels of inter-office efficiency . . . the speed of the telephone plus the safety of the printed word.

External communications are usually ported through one station, with another as backup. E-LAN maintains multiple "virtual terminals" which may be assigned to physical stations on demand. Thus a user can temporarily suspend an interactive session with a remote computer to retrieve information from another channel . . . all with a few simple keystrokes.

E-LAN provides global capability to run CP/M compatible programs and so greatly increases the usefulness of this growing library of low cost software.

Time Office Computers manufactured by Electronic Control Systems, 99 Mount Street, North Sydney, ph: (02) 436 3333. Offices also in Brisbane, Adelaide and Melbourne.

HARTLEY REVIVED BY ARIADNE

Ariadne's rescue operation of the Hartley Computer group has been given the green light by the Foreign Investment Review Board.

Hartley is an Australian based company distributing its own specialised software and self-manufactured hardware both in Australia and overseas. Their products are universally regarded as exceptionally high quality.

To date the majority of Hartley's activities have centred on the public accounting field in which it has become recognised as the industry leader.

Unfortunately, due to a number of

factors, Hartley was placed into receivership in May, 1982.

Ariadne Australia Limited, have purchased Hartley's assets from the receiver. Ariadne (previously South Pine Quarries) is a publicly listed company whose major shareholder is the New Zealand group, H.W.Smith Limited.

Ariadne have formed two new Hartley companies to be called David Hartley Computer Australia Pty Limited and David Hartley Development Australia Pty Limited, and have appointed David Hartley Chairman of both companies.

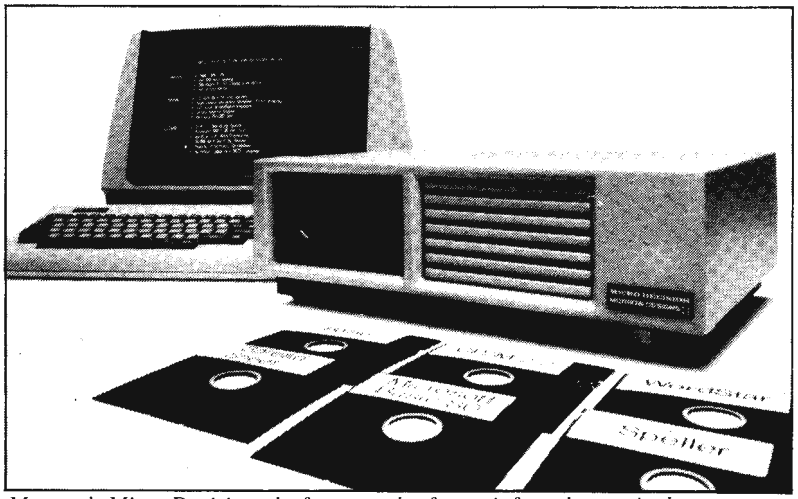
David Hartley Computer Australia Pty Limited will control manufacturing, finance, sales and marketing; and David Hartley Development Australia Pty Limited will be devoted to the research and development of new products, both software and hardware.

David Hartley Computers Australia Pty Limited is wholly owned by Ariadne Australia Limited and David Hartley Development Australia Pty Limited is owned jointly by David Hartley (25%) and David Hartley Computers Australia Pty Limited (75%).

This structure is designed to create the best possible environment for David Hartley to further research and develop the technology of Hartley software packages, hardware and training programmes.

Not only do the Hartley group intend to expand their activities in the Australian market, but also widen their export operation particularly to the U.S.A. and the United Kingdom.

Morrow throws in the software



Morrow's Micro Decision: the foreground software is free, the terminal costs extra.

Morrow Designs' is best known for its highly expandable S-100 computer systems. Their previous products sold at the upper end of the price range and featured expandability, multi-user capacity, and optional hard disk drives.

In contrast the Micro Decision, from Morrow Designs Inc, looks like an IBM Personal Computer, runs a significantly enhanced version of CP/M, and is one of the least expensive computers available.

Although not portable, it competes in price with the Osborne, and has included software, an enhanced operating system, and double density drives.

The Micro Decision comes in a beige cabinet which contains its Z80A CPU, 64 Kbyte RAM, two serial ports, and one or two 200 Kbyte single sided 5¼ inch floppy disk drives.

Although the system works with almost any terminal, the company hopes to ship most units with its optional terminal. The Morrow Designs' terminal has a detachable keyboard and a phosphor display.

In addition to two internal floppy disk drives, the system can accept up to 2 external drives as well as a modem, printer or any other serial interface device.

Like the Osborne, the Micro Decision comes with an array of software, at no extra cost. The system includes WordStar, an enhanced version of the CP/M 2.2 operating system, Microsoft Basic 80, Correct-It (an interactive proof reading program), and LogiCalc (a spreadsheet-financial planning tool). If bought separately, the software alone would cost nearly $1,800 – the total price of a unit with a terminal and one disk drive.

Morrow Designs engineers have added some significant enhancements to the standard CP/M package. Virtual Drive makes the machine act as if it had one more disk drive than it actually has. If a user references a drive that doesn't exist, the system automatically reassigns Drive A to emulate the non-existent drive. The system can then perform any operations with the physical drive A alternating between functioning as drive A and the 'virtual' non-existent drive.

Error messages don't require users to re-boot the system, thus losing any data in the machine's memory. The Micro Decision displays a message like "DRIVE NOT READY" and gives you an opportunity to correct the problem and try again.

The company is setting up offices around the world. In Australia contact Automation Stratham, 47 Birch Street, Bankstown 2200, ph: (02) 709 4144.

HBA SPEEDS UP CUSTOMER SERVICE

For more than half a million Hospital Benefits Association contributors, the tedious chore of filling out claim forms is no longer necessary. Instead, contributors simply present their accounts and receipts at any of HBA's 49 branch offices throughout Victoria, and within minutes a cash or cheque repayment is made.

Alternatively contributors can receive payment by filling out a simplified claim form and mailing accounts and receipts to head office where they are rapidly processed.

The simplification of claiming procedures is one of the more visible aspects of the online health insurance system, known as OLHIS, introduced recently by HBA, Victoria's largest health insurance organisation.

At the heart of OLHIS is an IBM 3033 computer located at HBA head office in Melbourne. This is linked to a network of display screens which are used by HBA tellers, "hotline" advisors and claims analysts as tools with which to extract and/or communicate information to the system. For every two display screens in branch offices a printer, linked to the central computer, is used by tellers to provide printed cheques as an alternative to cash payments.

The system processes 3.3 million claims a year (that is, one claim every two seconds) and oversees HBA's annual cash flow of approximately $380 million. It is versatile enough to handle the bulk of medical, ancilliary and hospital claims, contribution payments, general insurance transactions and ambulance subscriptions.

As well as simplifying the benefit

GOTO page 44 ➡

DAVIDSON BUSINESS SOFTWARE

MEANS BUSINESS!

BELIEVE IT! In business you need an 'edge' to succeed; we've got ours and now we're offering it to you. A sophisticated suite of business application packages with features that our competition just cannot match, Davidson Business Software offers you an asset – a range of powerful business tools that do more than just make business life easier, they make it more efficient, more productive . . . and more profitable.

These are competitive times and business is demanding more from its computerised systems than ever before. Davidson Business Software offers more with absolutely reliable audit standard book-keeping/accounting systems incorporating reporting features that put the facts right at management's fingertips, and a stock control/inventory system so advanced it'll access your five thousandth entry as fast as the fiftieth.

Designed for first-time micro users as well as larger businesses with distributed processing environments, Davidson Business Software Packages are menu driven; and that means easy to use by non-dp personnel, so you won't be wasting any valuable time or money when you change-over to your new Davidson system.

There are eight individual packages in the Davidson Business Software suite: used alone or integrated they enable you to build a system that meets your needs – not someone else's idea of them.

Integrated Invoice Package

Designed for use with the Accounts Receivable/Debtors Package it may also be integrated with the Stock Control/ Inventory Package or with the Stock Details Package. In conjunction with outstanding features such as automatic numbering and unlimited line items the integration options make this system a powerful asset in any area where invoices are being raised regularly.

General Ledger

A powerful, versatile system that offers audit standard recording over a chart of accounts up to five thousand entries long, this package is also capable of generating nine reports ranging from general journal listings to high level statements for management use.

Accounts Receivable/Debtors

Helps solve your cash flow problems and saves time by providing meaningful reports on delinquent and inactive customers in addition to its normal automated ledger function of producing monthly statements of account activity with opening and closing balances. May be integrated with the Cash Receipts Package or the Integrated Invoice Package.

Accounts Payable/Creditors

Designed not just to record the fact that money has been spent, but as an aid to the analysis of spending patterns. Highlights areas of cost increase and generates reports allowing the effects of cost savings programs to be evaluated.

Cash Receipts Package

Capable of operating multiple separate cash receipts systems concurrently in a single or multi-user environment, this package's input and report formats closely resemble manual cash book systems allowing for ease of operation by non-dp personnel. Generates reports suitable for use with any existing general ledger system and can be fully integrated with the Accounts Receivable/Debtors Package.

Cash Payments Package

A suite of programs similar to the Cash Receipts Package but designed to ease everyday cash payment book-keeping. Used in the same way as the Cash Receipts Package this package may be integrated with the Accounts Payable/Creditors Package.

Stock Details

An invoicing aid with detailed item listings designed to cater for situations where invoices are regularly raised without stock being maintained. Ideal for contracting or similar service situations this package may be integrated with the Integrated Invoice Package and hence the Accounts Receivable/Debtors Package.

Stock Control-Inventory

Capable of handling a large inventory with detailed item descriptions for truly comprehensive stock reporting this package features an advanced system of file management giving vastly improved response times. May be fully integrated with other packages via the Integrated Invoice Package.

"Taking care of business," means just that. Buy Davidson Business Software and you can take care of yours. Rest assured we'll be taking care of ours, and that's YOU. Every Davidson Business Software Package comes with an unbeatable four year manufacturers guarantee – yes, we're that confident of the product! It's going to be easy for us to take care of business, how about you. If you'd like to know more about the remarkable Davidson Business Software suite contact the Australian Distributors:–

Intelligent Terminals Pty Ltd

83 Glen Eira Rd., Ripponlea, Vic 3183. Ph: (03) 523 6311

BENCHTEST
PERSONAL COMPUTER

Chris Sadler and Roger Oliver take a close look at an elegantly styled 16-bit micro from Europe's largest office equipment supplier

OLIVETTI M20

One of the real advances that microcomputers have made over larger computers is their level of standardisation. Whereas big machines always have their in-house designed processors and software, microcomputers tend to be based around very few microprocessors and software products. Because of this, the appearance of so many packages that run in these environments means that new machines based on different processors have very little chance of catching up. Olivetti chose the Z8001 on which to base its M20 microcomputer. As it isn't a minicomputer in a micro box (like the Onyx), Olivetti decided to write its own operating system, although, as a concession to the rest of the micro world, it offers the mandatory Microsoft Basic. On an unusual machine the question must be whether it has sufficient features over a more standard system to make it worth having.

Hardware

The Olivetti M20 comes packaged in two detachable units, the main box and the monitor box. The main box houses the main board, a power supply and fan, the keyboard, and (on the review machine) a couple of disk drives. The monitor stands on a circular plinth, with respect to which the screen can be tilted. A shallow oval tray on top of the main box will accept the base of the plinth so that the monitor can be conveniently positioned in relation to the keyboard. The monitor draws its power from the main box — a single power cable drives the whole machine.

The keyboard has a numeric pad in addition to the qwerty layout. All 72 keys are grey (as is the plastic casing) except for a yellow one and a blue one on the left-hand side. The manual suggests that the blue and yellow keys are respectively control and command keys, although on the review machine both were labelled 'SHIFT', which makes it much harder to remember which is which.

There is a reset key above the coloured ones, and two mysterious keys labelled 'S1' and 'S2' above the Return key... more about these in the software section. All keys auto-repeat when held down for more than a short time. The keyboard is 'sculpted' and the keys make a positive click sound. Ten different character sets are available, as follows: USA ASCII, Italian, French, British, German, Spanish, Portuguese, Norwegian/Danish, Swedish/Finnish and the USA ASCII + Basic. The review machine was the last of these, with a Basic keyword etched on the front edge of each alphabetic character key.

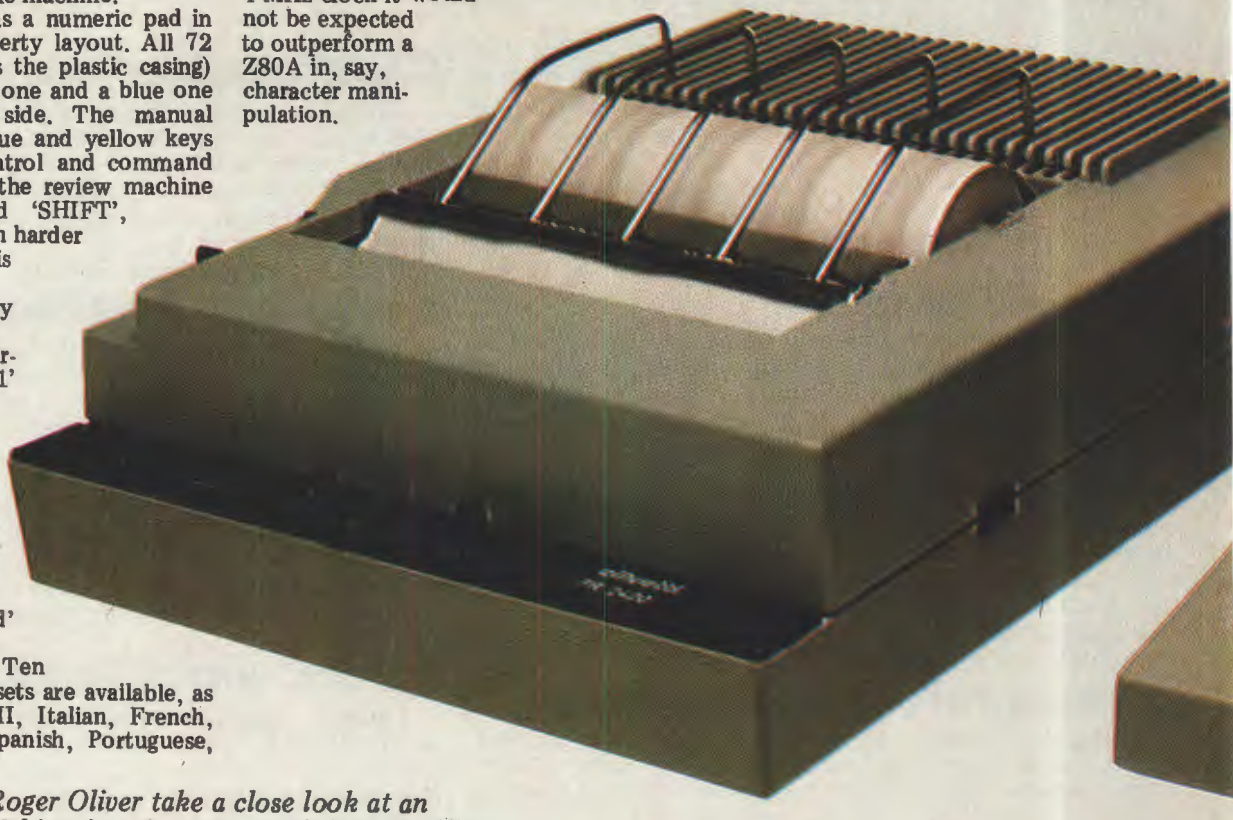
Above the keyboard are two horizontal slots (unmarked) for the disks. Unusually, the rightmost drive is nominated drive zero. The disks are 5¼in soft-sectored double-density double-sided, 35 tracks/side, 320 kbytes unformatted. This drops to 286 kbytes formatted, which doesn't compare particularly well with other DDDS disks.

The main PC board has three edge-connectors which extrude from the rear of the cabinet. One of these is for the monitor; the others are a parallel (Centronics) and serial (RS232C) interface for the different printers. Two screws at the back secure the top and, once this is lifted off, everything else seems to slide apart very neatly. The keyboard mounting and disk drive mounting lift away to reveal the main board.

The processor chip is at the front of the board. It is a Z8001, Zilog's 16-bit, capable of addressing more than 64k. Along with a 16-bit data bus, this should offer a speed advantage over 8-bit systems in arithmetic operations and memory access, although with a 4 MHz clock it would not be expected to outperform a Z80A in, say, character manipulation.

To the left is the ROM area — on the review machine there were two chips in place, sockets for another two and space on the board for another four, giving 8k for ROM. Further back on the board are other devices like disk controller, etc. On the right-hand side there is 128k of RAM (the standard configuration), beyond which the board becomes a motherboard to three small expansion sockets and two larger ones. Each of the smaller sockets can accept an additional board with 32k of memory, so the maximum memory is 224k if the monochrome monitor is used. The colour monitor, however, uses one slot and so gives a maximum memory of 192k. The review machine had a black and white monitor and a single memory expansion card (ie, 160k).

The two larger sockets (50 connectors per side — the pinouts undocumented) are for an IEEE-488 interface socket and a pair of RS232 (or 20 mA loop) ports, and pop-out panels exist at the rear of the cabinet to allow for the necessary cabling. The board gives the appearance of a clean, uncluttered (and not particularly densely populated) design, although the review machine had a few 'fixes' snaking between the chips. On the extreme right at the back is a recessed, spring-loaded switch, allowing the system to be rebooted by sticking something sharp into the recess. The review machine showed evidence that people just don't carry sharp things around with them anymore as the area surrounding the reboot hole looked scratched and scribbled on.



Olivetti offers a choice of four printers — a thermal one (which we had), a fast (140 cps) or slow (100 cps) matrix printer, or a daisywheel. The thermal printer and the slow matrix printer are capable of screen-dump graphics.

The screen can be configured for 16 lines of 64 characters or 25 lines of 80 characters (rather crammed together) with a corresponding alteration of character size. Likewise, graphics can be resolved to 512 x 256 pixels or 480 x 256 pixels. The colour monitor provides black, red, green, yellow, blue, magenta, cyan and white, while the black and white monitor supports reverse video. With its non-glare glare surface, the screen gives a crisp, steady image and the system runs very quietly. On power-up the system performs seven seconds' worth of diagnostic tests, sizing up the memory, testing which drives are on-line, etc. If, during the self-test, one of the keys B, D or L is pressed, the following events occur:

B: boots the Basic subsystem directly;

D: loops through the disk-testing portion of the diagnostic until some other key is pressed;

L: loops through the entire diagnostic until some other key is pressed.

When we tried the disk test, we discovered that drive 0 would not work and, although the disk test was run repeatedly thereafter, it never signalled this fact. On taking the system apart,

Photography by Kokon Chung

OLIVETTI M20

we discovered that the drive had slipped its belt, and it worked perfectly once that was repaired.

Software

Software consists of the operating system PCOS (Professional Computer Operating System) and a large Microsoft Basic subsystem.

The first thing one can say about PCOS is that, by microcomputer standards, it is big. On the review machine, it left only 58k of user memory out of an original 160k. PCOS is composed of three parts: a nucleus, which contains system primitives, memory and device control code, etc; a set of memory-resident utilities (ie, commands); and a set of disk resident (transient) utilities. Memory is configured according to the Z8001 segmentation scheme as follows:

Segment	
0	PCOS kernel
1	Basic interpreter and PCOS utilities
2	PCOS variables, Basic stack and tables, user memory
3	Screen bitmap (and colour bitmap)
4	Diagnostics and Bootstrap

In PCOS, 'system' programming consists of:

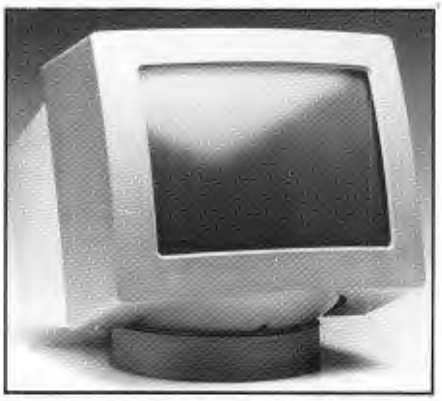
i) controlling which of the utilities will be transient or resident;
ii) manipulating files and volumes;
iii) 'programming' the keyboard;
iv) setting certain operating parameters;
v) constructing a turnkey boot-up program.

The system disk is distributed with certain utilities compulsorily resident (marked as such in the table of PCOS commands which follows this section). Transient utilities are those which are loaded from disk when invoked and overwritten when they complete. Any utility which is going to be used more than once or twice in a session can be 'locked' into memory by means of the PLOAD command. It is possible to generate a new version of the operating system by PLOADing a set of utilities into the resident area and then PSAVEing the whole memory image onto a new system disk.

Volumes and the files which are stored on them can be manipulated by means of a series of commands which begin with 'V' and 'F' respectively. Thus, FCOPY transfers a single named file while VCOPY would back up a whole disk. Strangely there is apparently no command for deleting files! The Basic manual suggests using the Basic command KILL, which involves invoking the Basic interpreter, issuing the KILL command and then exiting from Basic — all just to delete a file! However, we discovered a utility (undocumented) on the system disk named FKILL.CMD which sounded like what we were looking for — anyway, it worked.

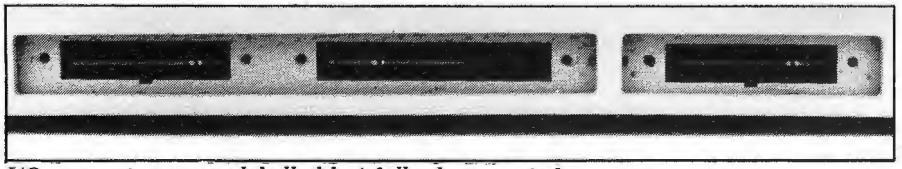
Security works on two levels — disk and file. As usual, a disk may be hardware write-protected (by physically blocking a 'write-permit' hole on the disk); it may also be password-protected against any unauthorised access. Files may also be software write-protected and password-protected. Basic programs may be SAVEd so that they can be executed but not LISTed or RUN.

Any key which generates a printable character can be reprogrammed, by means of the PKEY command, to produce any other character, or a string of characters. In particular, the substitution string can be a Basic or PCOS command, or a sequence of commands, separated by the ASCII codes for CR and LF. A series of PKEY commands can be saved on disk and downloaded at the start of each session, thus customising the keyboard — the Basic keywords printed on the keycaps are enabled in this way through a file on the system disk named SCIENTIFIC.BAS. (The key COMMAND is depressed in conjunction with the desired keyword key to obtain the Basic keyword.) A whole sequence of commands initiated by a single keystroke is as close as PCOS allows to the sort of command file processing obtainable in other operating systems (eg, SUBMIT in CP/M).



Standard black and white VDU

The review machine came with an optional keyboard featuring Basic keywords.



I/O connectors are unlabelled but fully documented.

Three commands exist for configuring the environment for a particular session. SSYS takes five parameters which set the time and date, the number of (256 byte) blocks by which files are to be extended, the screen format (eg, 25 lines by 80 characters, etc) and a disk read/write verification switch. SBASIC allows the user to define the amount of open files and windows permissible and the size of the I/O buffers. Clearly, the more open files and windows allowed for and the larger the record buffer, the less memory there is for the user's code. As a rule of thumb, each window needs 90 bytes and each file needs 600 bytes in addition to its record buffer. By comparison, each memory-resident utility takes about 1800 bytes. The command SFORM sets up the printer. One of the parameters is the type of printer (eg, 'pr2400' for the thermal type) so it may not be too straightforward to interface a printer not supplied by Olivetti to the

Basic reserved words

Commands

AUTO	LLIST	RUN
CONT	LOAD	SAVE
DELETE	MERGE	SYSTEM
EDIT	NAME	TRON
FILES	NEW	TROFF
KILL	NULL	WIDTH
LIST	RENUM	

Statements

CALL	LINE INPUT
CHAIN	LINE INPUT #
CIRCLE	LET
CLEAR	LPRINT
CLOSE	LPRINT # USING
CLOSE WINDOW	LSET
CLS	ON ERROR GOTO
COLOR	ON GOSUB
COLOR=	ON GOTO
CURSOR	OPEN
DATA	OPTION BASE
DEFDBL	PAINT
DEF FN	PRESET
DEF USR	PSET
DEFINT	PRINT
DEFSNG	PRINT #
DEFSTR	PRINT USING
DIM	PRINT # USING
DRAW	PUT
END	PUT£
ERASE	RANDOMIZE
ERROR	READ
EXEC	RSET
FIELD	RESTORE
FOR/NEXT	RESUME
GET	RETURN
GET #	SCALE
GOSUB	STOP
GOTO	SWAP
IF... GOTO... ELSE	WHILE/WEND
IF... THEN... ELSE	WINDOW
INPUT	WRITE
INPUT LINE	WRITE #

Functions

ABS	HEX$	RND
ASC	INKEY$	SCALEX
ATN	INPUT$	SCALEY
CDBL	INSTR	SGN
CHR$	INT	SIN
CINT	LEFT$	SPACE$
COS	LEN	SPC
CSNG	LOC	SQR
CVD	LOG	STR$
CVI	LPOS	STRING$
CVS	MKI$	TAB
EXP	MKD$	TAN
EOF	MKS$	USR
ERL	MID$	VAL
ERR	OCT$	VARPTR
FIX	POINT	WINDOW
FRE	POS	

OLIVETTI M20

M20. One parameter is an optional string which, if supplied, will be printed as a title at the top of each page of printout.

Access to the printer is gained by appending '+PRT' onto the end of every command. Output is directed to the printer only as long as that command is operative — in the case of BASIC (the command which invokes the Basic subsystem) all screen I/O within the subsystem will be copied to the printer. The manual mentions '+CIN' (for Communications INput), which directs input from the serial port to the system (in place of keyboard input). '+CONS' resets both of the above, returning both input and output to the console.

On boot-up, once the memory-resident portion of PCOS is in place, the system searches for a file called INIT.BAS, first on drive 0 and then on drive 1. If it finds one it will begin executing the program, which can contain PKEY commands and S-type environment commands as well as an ordinary Basic program. Thus the system can be made completely turnkey and the whole machine customised every time it is switched on.

Other commands include SPRINT, which dumps a given window from the screen to the printer with an optional title or time/date entry, and LABEL, which enables one to write a title, vertically or horizontally, at a given point on the screen and up to 16 times the normal character size. A number of user aids discussed in the manual were not present on the review system. These included HELP, COMMANDS and ERRORS, which provide lists of commands and error numbers, together with facilities to obtain a description of individual commands and error numbers — but how satisfactorily they work we cannot tell.

Three facilities which are available within Basic require access to utilities within the operating system, and these should be resident if Basic is to make calls to them. They are the IEEE-488 extension package; MI, a utility which enables a Basic program to pass a Z8001 machine code instruction directly to the processor; and LTERM. The two keys S1 and S2 mentioned in 'Hardware' are actually the equivalent of the Return key, except that the utility LTERM keeps track of which of the three 'return' keys was actually depressed. This enables a programmer to provide users with a variety of input keys — useful for setting up menus, Y/N answers, and so on.

PCOS seems to be an irritating operating system to use — it doesn't react in a very consistent manner. Sometimes it is necessary to specify the disk from which one wishes to work, and at other times not. System reset is sometimes achieved with RESET+ CNTRL and sometimes with RESET+ SHIFT (the RESET key should be depressed fractionally after the other one). The PCOS file security system lays traps for the unwary. You need only mistype one key when resetting a disk password and fail to realise it and you are in trouble, as there's no way of breaking a forgotten password.

Even worse, since once the password has been correctly supplied access is granted, even if the password is changed, you will receive no indication for the rest of the session. Thus, at the end of the session you might (as you should) take a back-up copy onto (assuming a rolling sequence of disks) a previous copy! Incidentally, if the colon is left off the volume specifier when the VLIST command is used, PCOS announces that the disk is empty — this may give you a heart attack (where are my files?) or, even worse, persuade you that the disk in question is nice and empty and suitable for back-up!

Other criticisms are that there seems to be no way for users to create their own utilities for insertion into the system and that there is no opposite to the PLOAD command whereby resident commands can be made transient. Neither is there any way of finding out which commands are resident in any given PSAVEd system. Finally, although none of the 'help' files were supplied with the review system, some intriguing undocumented commands were found (FFREE, FKILL, FMOVE, FNEW, PRUN, RKILL, SCOMM, SDEVICE, VALPHA, VMOVE, VQUICK). Table 1 shows the documented commands.

The high level language provided with the M20 is Microsoft Basic Version 5.2, with special extensions covering the graphics capabilities and the IEEE-488 interface. All the basic commands, statements and functions are listed in Table 2.

The SAVE command has some interesting features. Unless an ',A' is appended to the command, the program is stored in packed binary format to save space. If ',P' is appended instead, the file is saved in 'protected' form, which allows it to be run but not listed or altered in the future. TRON and TROFF set the trace flag; if it is on, line numbers are displayed as the program executes. There are the usual control structures: FOR. . . NEXT, IF. . .THEN . . . ELSE, WHILE. . . WEND and GOSUB.

Arithmetic may be performed in 2-byte integers, 4-byte single precision and in 8-byte double precision. Functions for conversion between these are provided. Using DEFINT, DEFSNG, DEFDBL and DEFSTR, implicit variable typing by initial letter of variable name is possible. For example, the statement

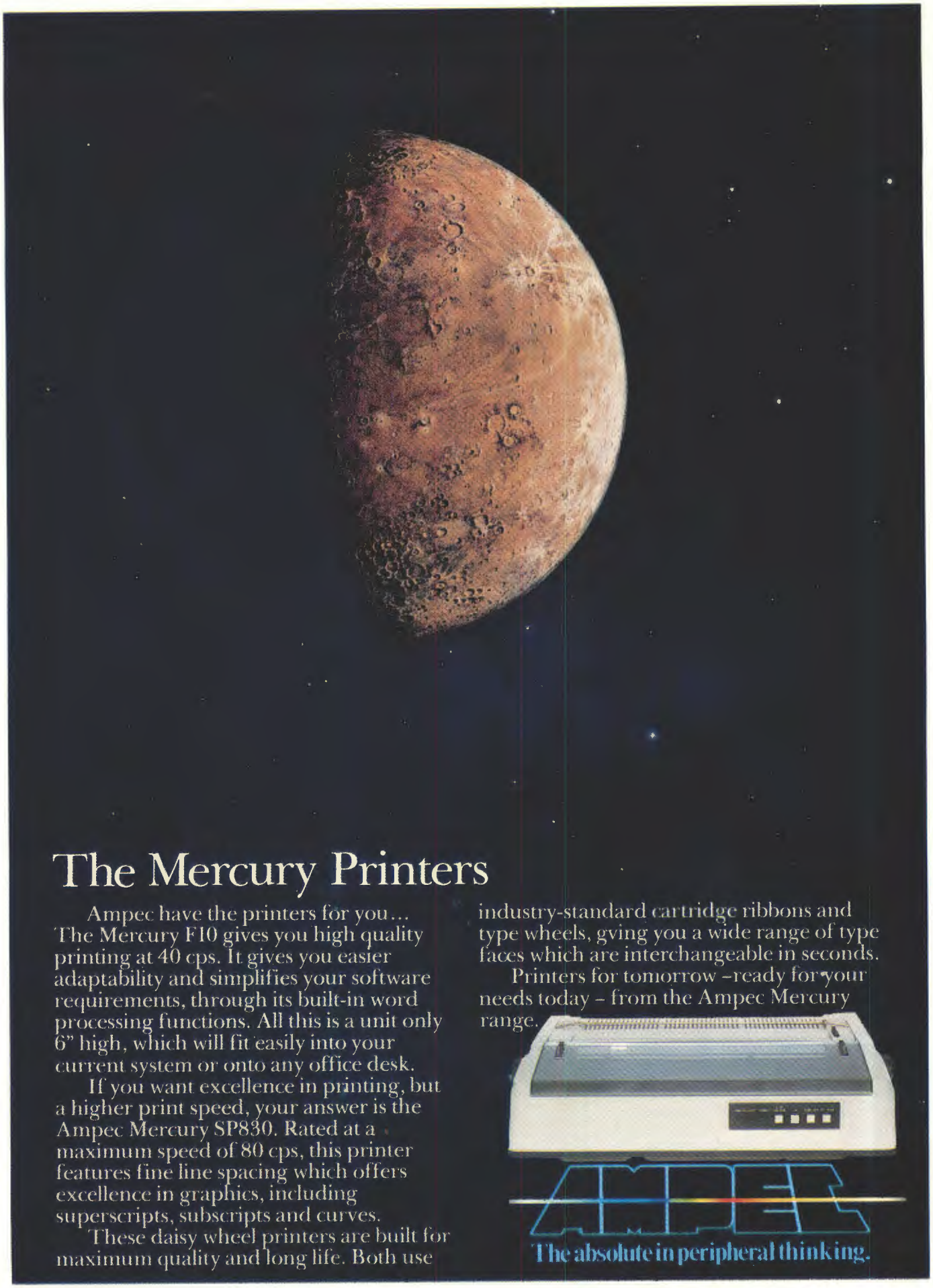
10 DEFSTR S, U—W

will cause all variables beginning with the letters S, U, V and W to be of type STRING. Implicit typing may be overwritten by adding a character at the end of the name: ie, % for integers, ! for single precision, £ for double precision and $ for strings.

Data files may be either sequential or random. The former are set for input (ie, read), output (write) or append when they are opened; they are processed with the INPUT#, LINE INPUT# (ie, ignore delimiters), PRINT# and PRINT# USING statements. Random files are handled completely differently; the file is declared to be random when it is opened, and the maximum record length is also declared. Unfortunately, it is not possible to set the file to be read-only or write-only if it is a random access file. Communication between program and file is conducted via a buffer. GET# transfers a record from file to buffer and PUT# vice versa. To extract data from the buffer, the FIELD statement assigns specific buffer locations to field names. The field names must not appear on the LHS of an assignment if they are to be used later to address the buffer; hence the LSET/RSET statements are required to place data in the buffer. Since only string data can be placed in the buffer, the functions CVI, CVS, CVD and MKI$, MKD$, MKS$ are needed for interconversions.

BASIC	invoke Basic interpreter	Resident
COMMANDS	list all commands	
[COMMAND]?	display an explanation of the specified command	
ERRORS	list all error codes	
E n	display an explanation of error code number n	
FCOPY	copy named file	
FDEPASS	unset a file password	
FLIST	list a named file	Resident
FNEW	create a named file	
FPASS	set a file password	
FUNPROT	remove write-protection from a file	
FWPROT	write-protect a file	
HELP	display Help routines	
IEEE-488	invoke the IEEE-488 Basic control package	
LABEL	invoke the Labelling package	
LTERM	return number of Return key last pressed	Resident
MI	invoke machine instruction routine	
PKEY	program given key	
PLOAD	load and lock utility into memory	Resident
PSAVE	save current system on disk for subsequent reboot	Resident
SBASIC	set Basic environment	Resident
SFORM	set printer environment	
SPRINT	print screen	
SSYS	set system environment	Resident
VCOPY	copy volume	
VDEPASS	unset a volume password	
VFORMAT	format a disk	
VLIST	list a volume directory	Resident
VNEW	create a volume on a disk	
VPASS	set a volume password	
VRENAME	rename a volume	

Table 1



The Mercury Printers

Ampec have the printers for you... The Mercury F10 gives you high quality printing at 40 cps. It gives you easier adaptability and simplifies your software requirements, through its built-in word processing functions. All this is a unit only 6" high, which will fit easily into your current system or onto any office desk.

If you want excellence in printing, but a higher print speed, your answer is the Ampec Mercury SP830. Rated at a maximum speed of 80 cps, this printer features fine line spacing which offers excellence in graphics, including superscripts, subscripts and curves.

These daisy wheel printers are built for maximum quality and long life. Both use industry-standard cartridge ribbons and type wheels, gving you a wide range of type faces which are interchangeable in seconds.

Printers for tomorrow –ready for your needs today – from the Ampec Mercury range.

AMPEC

The absolute in peripheral thinking.

The Word Processing Solution

VISION·80™

zardax

Put word processing on your apple for only $575 (ex tax)

Now totally compatible—

zardax — Australia's top selling easy to use word processor

and

VISION·80 — Australia's No. 1 80 column board, combine together to give you the ultimate solution in professional word processing.

distributed by
IMAGINEERING

AVAILABLE FROM YOUR
LOCAL MICROCOMPUTER DEALER

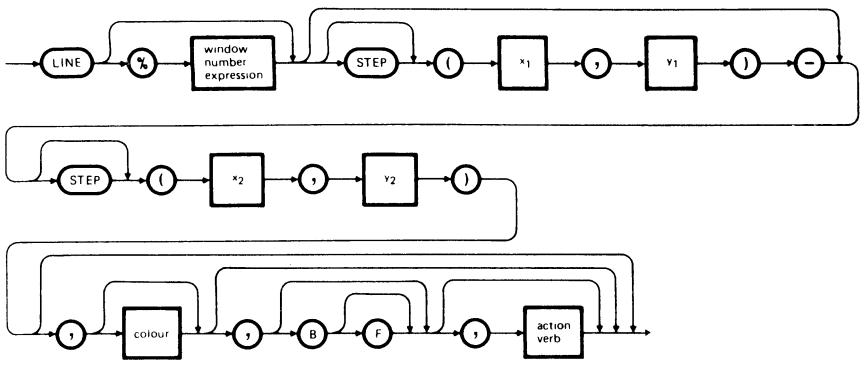


Fig 1

The most interesting features of the Basic's graphics facilities is that the screen can be divided into a maximum of 16 independent windows. (Strictly speaking, they are not real graphics windows since they cannot overlap non-destructively.) The WINDOW function subdivides the current window (either horizontally or vertically) and returns the new window number. The WINDOW% (expression) statement causes the user to 'move' to the window given by the expression. The usual DRAW and CIRCLE statements are available; the former is very complex since it also has to double for the MOVE command (ie, changing position without drawing a line). When drawing a line one can AND, OR, XOR and complement with the existing screen contents. The COLOR statement allows one to select four out of eight colours for use at any given time and to set foreground and background colours for each of the windows.

A nice feature of the graphics is that it is possible to store part of the screen display (text and graphics), pixel by pixel into an array, and to recreate the image at a later date. The PAINT statement allows any enclosed space to be filled in.

The IEEE-488 interface is apparently accessible to the user via a set of Basic keywords, but these are not documented in the Basic manual. There is an IEEE-488 Parallel Interface Reference Guide which comes with the actual interface, so perhaps they are described there. By means of these keywords it is possible to read or write data from compatible devices: assign talker/listener status to other devices; receive and respond to service requests from other devices; and act as a controller for other devices.

Generally speaking, the syntax of the Basic is rather complex (see Figure 1). There are examples of one keyword being made to perform too many functions. For example, WINDOW can be used as a function which takes on the number of a new window (which is created as a 'side effect') and which has a special case when it takes on the number of the current window (and no new window is created); WINDOW can also be a command causing another window to become the current window.

Fairly sophisticated program segmentation facilities are provided. It is possible to CHAIN programs together so that one 'calls' another. Communication between programs is via data files or COMMON variables. The latter seem to be like the Fortran facility in that a block of memory is set aside for access by various routines. According to the Basic manual, variables in COMMON statements in different programs are matched by position and type, and not by name. Thus, if one has

10 COMMON A$, N

in one program, and

10 COMMON B$, X

in another, and they were CHAINed, then A$ and B$ would access the same location, as would N and X. Unfortunately, this feature did not appear to work perfectly on our machine. One can also MERGE programs with the current program, allowing subroutines and blocks of code to overlay one another as they are needed.

Potential

The product literature explicitly directs the Olivetti M20 at the commercial and scientific user. This is backed by an apparently sound maintenance and guarantee policy and a list of software products. For the scientific user there is the option of the IEEE-488 interface, which grants access to a range of laboratory equipment, and a set of Basic graphics calls to assist with the display of information. In addition, the Basic BM8 ran exceptionally quickly so that the system, with the propriety Olinum (scientific subroutine library) and Olistat (statistical subroutine library), is probably a reasonable number-cruncher. On the engineering side, there are a few design and numerical control packages.

On the business side, there are Olispec, which provides the usual accounting suite; Oliword for word processing; Olientry for data preparation; and sales and production management packages and specialised packages for solicitors, independent schools, quantity surveyors, builders and electricians. Finally, there is Multiplan, the Microsoft forecasting and modelling package. Utilities include ISAM, Olisort and Olidoc — for 'documenting' a Basic program — together with Oliterm (a terminal emulator) and Olicom (a remote batch entry package).

There is also Olimaster, which purports to be an author language for 'development of interactive instruction' but we felt that the system was not really flexible enough to find widespread educational use. The system is not suitable for the hobbyist.

We have mentioned this software under 'Potential' rather than 'Software' because it was not available to us for review.

Expansion

Most of the hardware expansion features have been mentioned in the 'Hardware' section. In summary, a fully expanded system would offer twin floppy disks, 244 kbytes (with black and white monitor) or 192 kbytes (colour monitor) of main memory, an IEEE-488 parallel interface and a pair of RS232 or 20 mA current loop serial ports.

On the software side, the list mentions an assembler (and, indeed, with CALL and EXEC the Basic interpreter is configured to interface with assembler routines). Presumably, Olivetti feels that offering access to IEEE-488 based peripherals will take its potential market as far as it wants to go.

Documentation

The manuals are masterpieces of slow, careful explanation and are probably ideal for an extended tutorial on fundamental microcomputer operations, with long sections on the use and abuse of floppy disks and a lot of trouble taken with the initial 'getting started' phase. Troubleshooting is dealt with in the same style, using large flowcharts which end up in boxes with messages like 'contact Olivetti dealer/distributor'. PCOS commands and Basic keywords are dealt with exhaustively, with explanations of each of the field values and syntax diagrams (although not very many examples).

However, manuals have a dual function to perform. They have to get the user started on the system and then have to serve as reference material for filling in all the details, and the Oli-

Benchmark timings

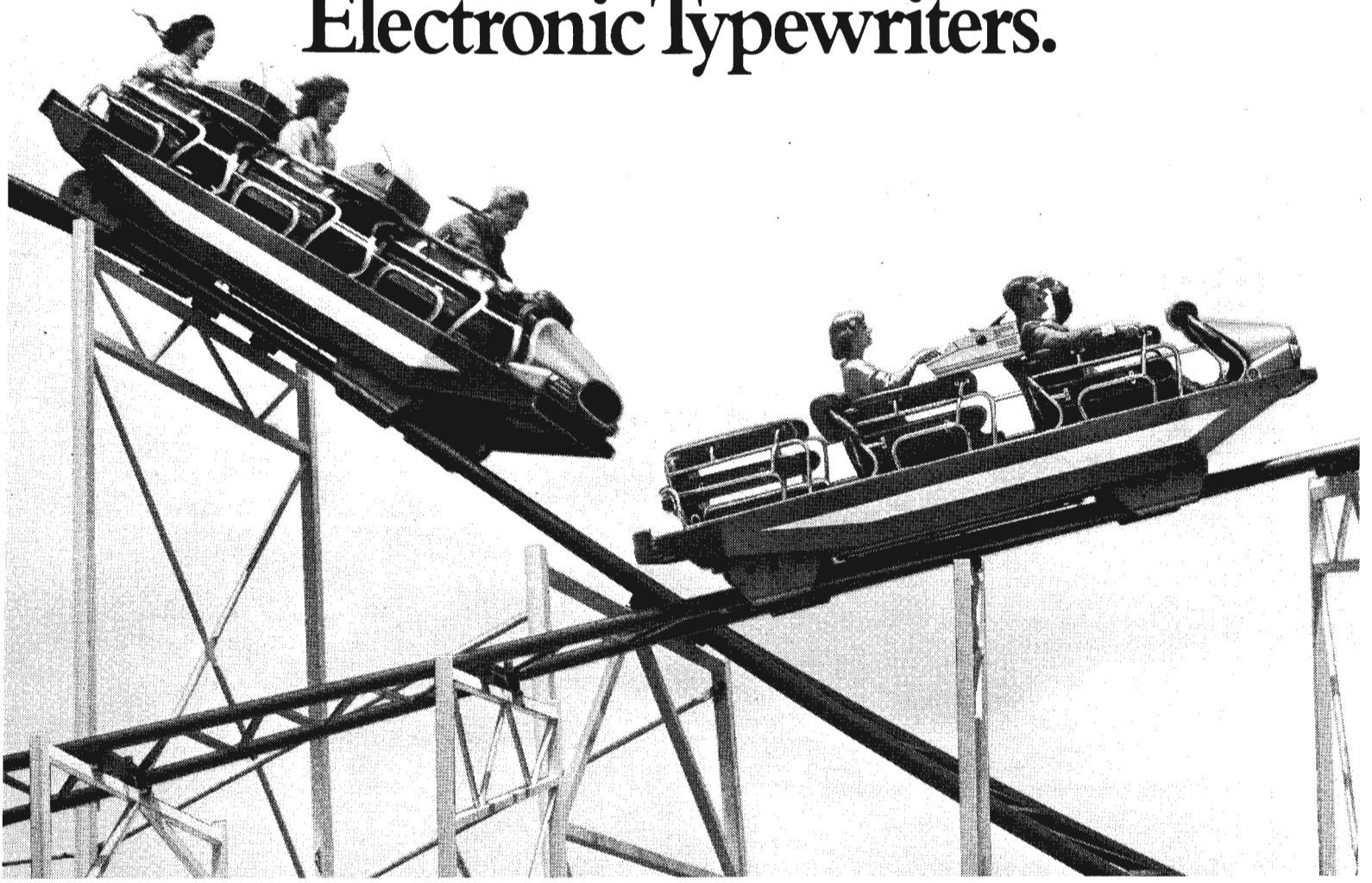
BM1	1.3
BM2	4.0
BM3	8.1
BM4	8.5
BM5	9.6
BM6	17.4
BM7	26.7
BM8	1.6

All timings in seconds.

Technical data

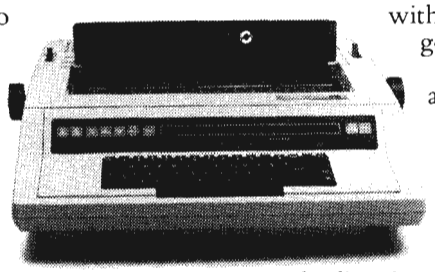
CPU :	Z8001, 4 MHz
Video:	16 x 64 or 25 x 80 character display; 512 x 256 or 480 x 256 pixel graphics, black and white or colour
RAM:	128k as standard + up to three 32k boards
ROM:	2k standard, expandable up to 8k
Comms:	Centronics parallel and RS232 serial, standard; IEEE-488 and two ports RS232 or 20 mA loop
Keyboard:	72 keys, programmable
Bus:	Olivetti's own — 16 data lines
Disks:	One or two, 320k (unformatted) 5¼in floppies
Printers:	Thermal, matrix or daisywheel

Xerox introduces yet another way to get your business on the up and up. Electronic Typewriters.



Sometimes in their zealousness to keep everything on the right track, businessmen have a tendency to overlook the little things. Those small but highly productive areas that surprisingly could be the difference between profit and loss.

Take a look at the amount of work a secretary does and you'll realise how much of a help an electronic typewriter could be.



That's why Xerox is introducing the Memorywriter range of electronic typewriters that increase the tempo of work threefold. The Memorywriter's first task though, is to make it 'easy to get to know' with its familiar keyboard. It then automates such time consuming tasks as centering, emboldening and underlining on important letters.

The Memorywriter simplifies margins and tabs, error corrections and the layout of complicated tables.

It also has the capacity to store important addresses, often used phrases and layouts.

(Memorywriter models can store from 946 characters to 32,000 characters.)

The result of all this of course is that you end up with superbly typed documents and invoices going out to clients that much quicker.

With the Memorywriter handling all that work, it then frees your secretary to attend to other important matters, allowing you of course to move onto other things.

Like our photocopiers and information processors, the Xerox Memorywriter is going to get business moving in the right direction. The Memorywriter. Get one and you'll be able to sit back and enjoy the ride.

Ring Rank Xerox right now or return the coupon. Contact Janet Dwyer in Sydney on 9225055 or after December 20 on 4490449, or your local Rank Xerox sales office. Melbourne 4201212, Brisbane 2216511, Adelaide 2231427, Perth 3273535.

RANK XEROX®

Setting the standards.

I'm interested in the Xerox Memorywriter. Please send me details: Postfree 31, Rank Xerox (Australia) Pty. Limited, P.O. Box 934, North Sydney, NSW 2060.

NAME _____ COMPANY _____

POSITION _____ ADDRESS _____

_____ P/CODE _____ PHONE _____

® XEROX and RANK XEROX are registered trade marks.

RXA1364/82

vetti manuals fall down somewhat here. Instead of an index, there is an exhaustive table of contents (five pages long in the PCOS manual). This references everything one could want to look up — but in page order rather than alphabetically, so it's quite hard to use. As we had only the PCOS and Basic manuals, hardware information was rather hard to come by and information about (say) the IEEE-488 interface was virtually nonexistent. Although there are 'pocket' reference manuals for PCOS, Basic and the interface (not supplied), there seems to be no hardware manual at all.

The manuals are very glossy and one gets the impression that considerable care has been taken in their production and translation into English. In the two volumes, only one sentence appeared to have wriggled through the translator's comprehension.

Prices

Olivetti has decided that its micro is going to be competitively priced with the current 8-bit systems. The review machine's configuration (standard system with 128 RAM, dual minifloppy disk drives and a monochrome display) costs $4970 incl. sales tax). To this must be added the printer ($1565), the manuals and PCOS. As there was no price for Basic, it must be included in the standard price.

Olivetti sells three configurations (all of which carry a 90 days guarantee).

Upgrades and peripherals are not particularly inexpensive and as there are no technical specs for the hardware it is unlikely that second sources will appear. The dot matrix printers cost $1565 for 100 cps and $3970 for 140 cps. A 32k memory upgrade costs $290, the IEEE interface $545 and the serial ports $700.

Conclusion

The Olivetti M20 represents a brave attempt by a large firm to make its way independently in the microcomputer market. (By way of comparison, Texas Instruments and Hewlett Packard tried it; IBM and DEC did not.) This independence reflects itself by the decision to base the hardware on an unpopular processor; this cuts Olivetti off from the mainstream of microcomputer software development, both at operating system and application levels. Olivetti seems to be fully aware of this step as it is making efforts to provide the requisite software, both in-house and by recruiting external software houses.

The system could appeal to scientific/commercial users who derive confidence from dealing with a big firm which offers some sensitivity in meeting software needs and which is willing to provide extensive and sound maintenance and support.

FOR THE LAYMAN

The Olivetti M20 microcomputer is one of the new "16 BIT MICROS" currently available in the marketplace. (Refer to Newcomers article for description of the term BIT.)

Hardware

The M20 comes packaged in two detachable units. Keyboard and disk drives are in a single unit with a provision to stand the screen on top. There is a facility to plug the screen into the main unit thus reducing the need for power cords everywhere to power outlets.

The keyboard resembles a typewriter layout with the addition of a numeric keypad for rapid numeric only entry.

The disk drives hold 5¼ inch floppy disks each capable of holding 286,000 characters of useable information, which does not compare well with the available storage provided on similar systems.

There are a number of outlets (or ports) provided at the rear of the machine which enable a wide range of printers to be connected to the M20. One of the ports is used to connect the screen to the 'main box'. Facilities are also available for the addition of more memory and additional storage for the M20.

A variety of screens are available from a basic black and white monitor to a very sophisticated screen capable of producing a 3D effect in colour with full graphics capabilities.

Software

The operating system for the M20 is called PCOS, which is short for Professional Computer Operating System, and by microcomputer standards it is big which, for the user, means that a substantial part of your processing power is taken up by the operating system. There are a number of inconsistencies with the operating system that may make it difficult for a first time user to come to grips with. For example, there appears to be no command for deleting files, however there was a command on the disk which did work, although it was not documented!

The high level language provided for the M20 is Microsoft's Basic version 5.2, with special facilities for the graphics capabilities.

Now you've read about the

OLIVETTI M20

Personal Computer

come and see it at

Computer Edge

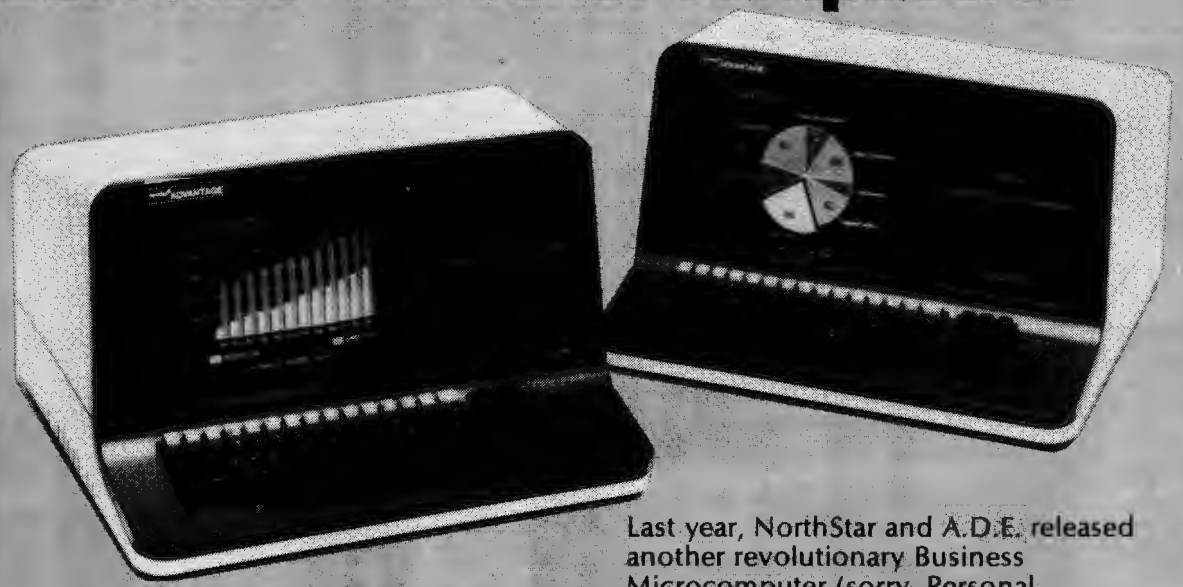
Computer Edge Pty. Ltd.

364 Ferrars Street, Albert Park, Vic 3206.
P.O. Box 44, Albert Park, 3206
Phone: (03) 690 1477

ADE 10TH YEAR OF COMPUTER COUNSELLING

WILL IT BE YOU?

Who will be the 50,000th user of NorthStar™ Business / Personal Computers?



We don't know either yet, but as the authorised Australian and New Zealand distributor of NorthStar microcomputers, we certainly hope it will be one of our customers.

At Anderson Digital Equipment we are far from surprised that the innovative U.S. manufacturer NorthStar Computers Inc., has sold close to 50,000 microcomputers in a little more than three years — with the two computers HORIZON and ADVANTAGE.

First came the amazing HORIZON of which 32,000 units have been sold (close to 500 in Australia and New Zealand). This nifty performer enhanced the introduction of the Personal Computer with full features, but we called it a Business Microcomputer.

Last year, NorthStar and A.D.E. released another revolutionary Business Microcomputer (sorry, Personal Computer) with added features such as extensive business (eh, Personal) graphics, a large range of software packages and many programming languages.

And no doubt you've heard about the 8/16 bit ADVANTAGE for large corporate, industrial and commercial users.

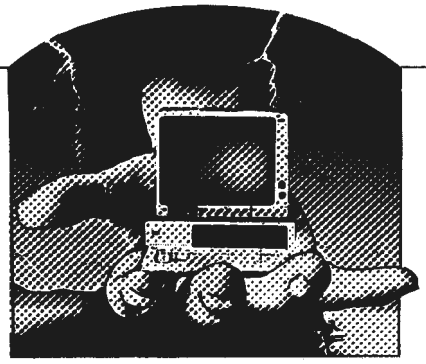
It's because of the numerous features, and the success of the two NorthStar microcomputers, we get a little confused. That's why we call them the BUSINESS/PERSONAL computers.

When two machines can cover such a wide range of industry and personal applications, they must have a lot more features than your regular Personal or Business microcomputer. After all, close to 50,000 users can't be wrong.

ANDERSON DIGITAL EQUIPMENT PTY. LTD.

ADE

P.O. BOX 422, CLAYTON, VICTORIA 3168, AUSTRALIA. PHONE: (03) 544 3444. P.O. BOX 341, PENNANT HILLS, NSW 2120, AUSTRALIA. PHONE: (02) 848 8533. Adelaide: 46 4062. Perth: 387 6055. Hobart: 34 4522. Canberra: 58 1811. Brisbane: 352 5788. Newcastle: 69 4325. Wellington: 69 3008. Auckland: 54 4224. Christchurch: 4 3001. Darwin: 81 2712. Singapore: (65) 449 4433. Bendigo: (054) 42 4322. Wangaratta: (057) 21 6443.



IN THE BEGINNING

by Lisa Clayton

It is not necessary for everyone to know how to program a computer and still less is it necessary to know how to solder the bits and pieces together. It is however necessary for everyone to have some idea of the basic principles and that is the intention behind this new segment being introduced to *ABC*.

Each month we will have a glossary to which we will continually add, and an expansion of a few of the more commonly used terms. As this is a new segment, we would appreciate reader input in the form of ideas concerning possible editorial content. Please write, don't ring as our staff are grossly overworked already.

Besides the glossary each month there will be a brief expansion on two or three of the aspects in the glossary. Fortunately bit is one of the early entries in the glossary along with baud and byte and they are also the most fundamental elements of computer systems. A bit is the most elementary component of any computer system. It is the basic component with the capacity to represent either a one or a zero. This is the number system used by all computers – called binary (covered in a later issue).

A byte is a group of bits, in an eight bit machine, there are eight bits to a byte, in a 16 bit machine there are 16 bits to a byte – that is to say that as the machine transfers information it does so in a group of bits at a time – a byte. This may be either from one part of memory to another, from the disk to the memory or vice versa, or from the memory to an external device. As external devices are capable of running at different speeds, such as printers, the flow of data to these devices must be variable. To describe the rate of flow of the data a term is used – BAUD RATE. The baud rate is the number of bits per second that are being transferred, these vary from as low as 300 bits per second up to 29,000 bits per second, depending on the capabilities of the device being transferred to. It is important to remember that although baud describes the number of bits being transferred, the computer is actually transferring the information a byte at a time.

Glossary

BAUD RATE: The speed with which data is transmitted. Technically known as the number of bits transmitted or received per second. Connected primarily with I/O ports, eg, you need information to be transmitted to a printer. The speed at which your data is sent along the wires is broken down into bits per second. In order to measure how many bits are sent the BAUD rate is necessary. Speeds vary from 50 to 96200, the most commonly used are 1200 to 9600. An average typist can type at 100 baud.

BINARY: The number system based on 1s and 0s used by all digital computers.

BIT: A bit represents one of the zeros or ones in the machine code.

BYTE: A byte represents logical groups of bits in binary code.

BOOT: This function is required to load or reload the operating system into the Central Processor.

CHIP: A thin piece of silicon onto which has been fixed anything from a few dozen to tens of thousands of circuit elements.

COMMAND: This is an instruction which is fed into a computer so that it will perform a function.

CRT: Cathode Ray Tube – This is the screen of a video terminal.

DATA: Information collected which needs to be fed into the computer via a program, this is then manipulated according to the structure of the program.

DISKS, SOFT: So that you are able to gather information from a computers' memory and store it elsewhere, disks are required. Commonly known as floppies these can be basically divided into two parts. The inner core is a piece of mylar film which has been treated with a magnetic material, the same as that in a cassette. The outer casing is thin plastic roughly 3mm thick. There are three holes in the floppy. Firstly the centre hole is located for the motor mechanism which rotates the disk. Secondly, the rounded rectangular hole permits the recording head to make contact with the surface of the floppy. Finally, the small round hole permits the drive system to identify various data locations on the disk – this is commonly known as the sector hole. Standard sizes for floppies are either 8 inch or 5.25 inch. Back ups should always be taken and stored in a safe place as they are susceptible to dust and other things.

DISKS, HARD: Somewhat similar to floppies except they are hard and usually non-removable. Their construction is such that they store a vast number of characters with data being transferred more quickly.

DISK OPERATING SYSTEM: These programs are necessary so that you can create one or more disks, create files to store and retrieve programs as well as managing disk storage.

DISK DRIVES: Can either be an all in one unit or can be connected via a cable and sit next to your keyboard and screen. These are used for housing disks and rotate the disks and position the read/write head.

HEADS: They read the surface by moving across the exposed surface and operate in an identical manner to a tape recorder head.

HARDWARE: An overall description for keyboard, VDU, drives and peripherals. This does not include software.

I/O (INPUT/OUTPUT): Computers are capable of transmitting and receiving information in two forms – parallel and serial. For this function ports are required to which cables are attached so that information can be passed either into a printer or another computer.

INPUT: This word is a term used for entering data into your computer.

MICROPROCESSOR: Another term for a microcomputer.

PROGRAMS: This is a sequence of computer instructions. Also called software.

PERIPHERALS: A general term for all of the extras which hang off a computer, eg, printers, modems, etc.

PROMPT: A message from the computer to indicate it requires input.

REGISTER: A register is a temporary memory.

RAM (RANDOM ACCESS MEMORY): Commonly known as read/write memory because when the computer transmits data into RAM it is "writing" and when it extracts information it is "reading".

ROM (READ ONLY MEMORY): This is a fixed set of bits which cannot be altered. Many computers and even calculators have built in ROMs that contain sequences of step-by-step instructions in the form of binary words (microinstructions). These instructions tell control circuits located on chip/s what to do when orders are received from the outside world.

The above memories will be discussed at a later date in more detail but try to remember these following points:

1. ROMs contain permament infor-

A Xerox Micro-Computer with software for $3,780 should keep everyone happy.

When it comes to Micro-Computers, it has to be described as the bargain of the year.

The incredibly versatile Xerox 820 is priced at $3,780. And for a limited period we're throwing in $1,000 worth of software absolutely free!

Here's what you get.

The low cost 820 comprises display screen, keyboard and processor with 5¼" single sided single density disc. And with it you get a CPM Operating System, Xerox Word Processing and Supercalc. The Xerox Micro-Computer with software for $3,780.*

(*The 8" Single Sided Single Density System shown above is optional and is available at $4,665.)

Ring Rank Xerox right now or return the coupon. It's an offer too good to pass up.

Phone Janet Dwyer at head office on 9225055 or after December 20 on 4490449, or your local Rank Xerox sales office. Sydney 2684860, Melbourne 4201212, Brisbane 2216511, Adelaide 2231427, Perth 3273535.

I'm interested in this fantastic Micro-Computer offer of $3,780 which includes a $1,000 worth of software absolutely free.
Send to: Postfree 31,
Rank Xerox (Australia) Pty. Limited,
P.O. Box 934, North Sydney, NSW 2060.

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

POSTCODE _____ PHONE _____

RANK XEROX®
Setting the standards.

RXA1354/82

® XEROX and RANK XEROX are registered trade marks.

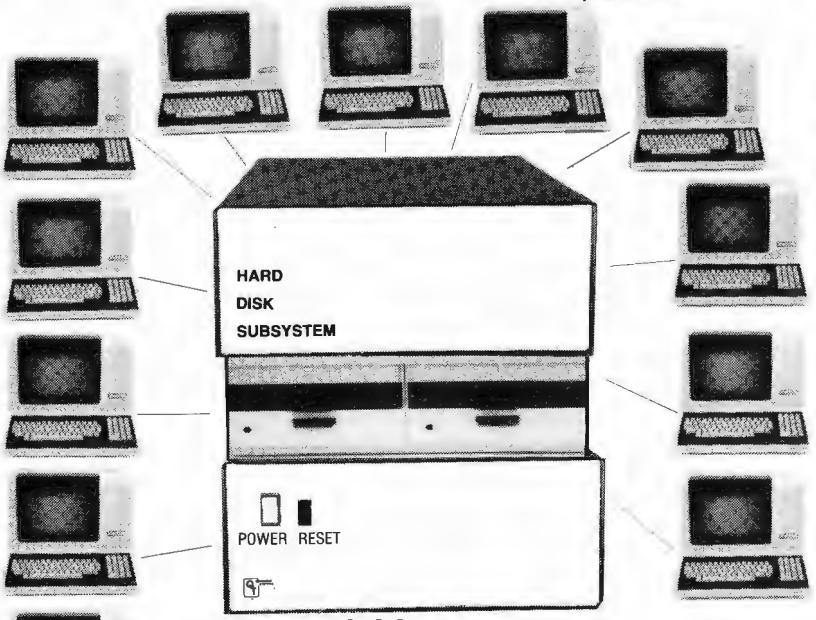
Q.T. COMPUTER SYSTEMS

SYSTEMS THAT GROW WITHOUT GROWING PAINS

Head Office:
41 Sydney St,
Marrickville 2204
Phone: (02) 519 2680

One Q.T. System 2000 Supports 16 CP/M User Stations

AND NOW AVAILABLE
as a standard feature with all systems
MEMORY DRIVE SOFTWARE
for lightning performance
SOON TO BE RELEASED
16 bit micro based
on the 8086 processor



Expandable, Multi-Processor, Multi-user, Multi-Tasking Microcomputer System

Here is computer power from Q.T. Computer Systems that grows as your requirements grow. It's the new SYSTEM 2000 . . . featuring a wide variety of computer resources. Expandable RAM and ROM storage, data communication interfaces, floppy and Winchester disk drives and printers . . . all shared by up to 16 users via a host processor system in a master/satellite configuration. Each user works with a fully dedicated Z80A (optional Z80B), 128K microprocessor system in a complete CP/M environment. Multi-processing is managed by our proprietory operating system and each user runs the industry standard CP/M operating system. You can start with SYSTEM 2000 in basic single user configuration . . . and stay with it. It grows with you. Contact us for more information on our newest system — the SYSTEM 2000.

Typical Applications include — A multi-station word processing network, educational systems, business systems, real time data acquisition etc.

We are actively seeking local and interstate distributors for our new system. OEMs can purchase the system in knocked down form as bare boards, bare metal work, kits etc.

Prices and specifications subject to change without notice.

mation which is not lost when electrical power is removed from the ROM. ROM holds programs which the machine will use many times, and which must be present when the machine is first turned on. They are installed in the factory where it is "burnt" in.
2. RAMs contain temporary information which is lost as soon as the power is switched off.
3. These two memories are "inside" the computer.

SECTORS: A logical imaginary radial division of a disk. Information on each of the data tracks around the surface of the disk can be stored in one or more locations known as sectors.

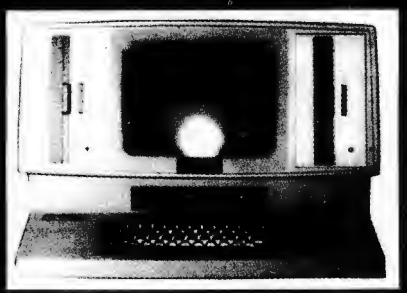
SOFTWARE: Another name for programs.

SYSTEM: This is where people usually become confused with computers, one word can be used to describe several different functions. For example system can be either a description of your overall computer equipment such as a keyboard, screen and disk drives plus printers, cables, etc. It is also used by some people when referring to the programs/software that is running the machine.

TERMINAL: Operator's work station consisting of a screen and keyboard.

TRACK: An imaginary concentric division of a disk.

Century Computer



Model C800-S (Price $4950 + S/TAX)

"YOUR BUSINESS COMPUTER"

* CP/M 2.2
* 64Kbyte ram
* Serial port
* VDU 8085 CPU 8275 CRT controller
* 24 x 80 chars with full features
* Z80A CPU 4MHz
* 2 x 1.25 Mbyte 8" Floppies
* Centronics printer port
* Option - S100 -5,7,6 or 11.6 Mbyte Hard disk available now

* Business software * Wordstar
* Supercalc * Cobol * DBASE II

Distributed by:

abacus

512 Bridge Road, Richmond, Vic 3121
Phone: (03) 429 5844

VECTOR 4

VECTOR 4 SPECIFICATIONS

Central Processing Unit:

Processors:	8-bit Z-80B™ and 16-bit 8088 (single or multiprocessor operation)
Clock Speed:	5.1 MHz
Memory:	128K Dynamic RAM Standard Expandable to 256K

Video Display:

Screen:	12 inch high contrast green phosphor 20 KHz Horizontal, 60 Hz Vertical
Alphanumeric:	24 Lines x 80 characters High resolution 16 x 13 dot matrix
High Resolution Graphics:	640h x 312v pixels (B/W)
Gray Scale Graphics:	160h x 312v pixels, 16 levels of gray 320h x 312v pixels, 4 levels of gray
Color Graphics:	External RGB Monitor 160h x 312v pixels, 8 colors 320h x 312v pixels, 4 of 8 colors

Keyboard:

Detached, with 8035 auxiliary processor. Capacitance keyswitch with 91 keys, including 15 programmable special function keys, cursor control keys, and 10-key numeric pad for rapid data entry.
Coiled cable with Interface

Input/Output:

Serial Keyboard
Centronics Parallel Interface
Qume/NEC Parallel Interface
RS-232 Serial Printer Interface
RS-232 Communications Interface
RGB color signals
Programmable Tone Generators and Speaker
S-100 expansion slots

Disk Drives:

Type of Disk:	5¼" Floppy	5¼" Winchester
Total Capacity:	630 Kilobytes	5 Megabytes
Transfer Rate:	250 Kilobytes/sec	5 Megabytes/sec
Rotation Speed:	300 RPM	3600 RPM

Configurations:

Model 4/20	Two floppy drives
Model 4/30	One floppy drive and one Winchester hard disk drive

I'd like to know more about Vector computers

- ☐ Please send me additional information
- ☐ Please tell me where I can get a demonstration

Name .....
Title .....
Company .....
Address .....
Nature of Business .....
Planned Applications .....

Mail to **Fiona Dicker, Dicker Data Projects Pty. Ltd.**
78 Captain Cook Drive, Caringbah, N.S.W. 2229.

$5295

VECTOR

THE COMPANY COMPUTER.

DEALER ENQUIRIES INVITED

Dicker Data Projects Pty. Limited, 78 Captain Cook Drive, Caringbah, N.S.W. 2229. (02) 525 2122, 525 4707

Clearing away the jargon

Many businesses have an unclear idea of what a press/public relations agency can do for them. Graham Freeman offers some basic guidelines for those considering using PR for the first time.

"The press relations manager of the Source is no fool: he has gone on holiday. In his absence, one of the biggest catastrophes ever to hit the time sharing service has struck . . . " So reads the first paragraph of a recent news item reporting on new operating software problems for the US electronic mail system. And that kind of negative publicity, the PR function needs like a hole in the head – particularly in the (still relatively) new business of microprocessing and general computer technology.

ON THE DEFENSIVE

So let's get a few basic points straightened out, especially for any micro or OEM marketing manager considering using PR for the first time. Press or public relations – it amounts to the same thing at the end of the day: coverage in the media – should not be about 'going on the defensive'; the PR role should not be used when a company has 'dropped a clanger'.

Defensive PR has its role, but resorting to PR techniques chiefly for such purposes is as defeatist as regarding it merely as a convenient kind of cover-up. Skin-deep, 'cosmetic' PR should be a relic of the more secretive era, of hushing up rather than opening up.

> PR is about building up a positive, credible image for a company.

Today, it is harder to paper over cracks simply by producing a smoothly worded press release and expecting the press to print it verbatim; or attempting to project an image totally different from a company's reality; or using superlatives which are patently untrue to describe products or services; or denying the existence of serious company problems when they exist. Unfortunately there are still too many managing directors who feel this is the only value of PR; any other form of corporate communication is a waste of time.

WHAT CAN PR OFFER?

PR is about building up a positive, credible image for a company, providing marketing and sales staff with tangible back-up and, as is possible in many instances, actually providing valuable sales leads.

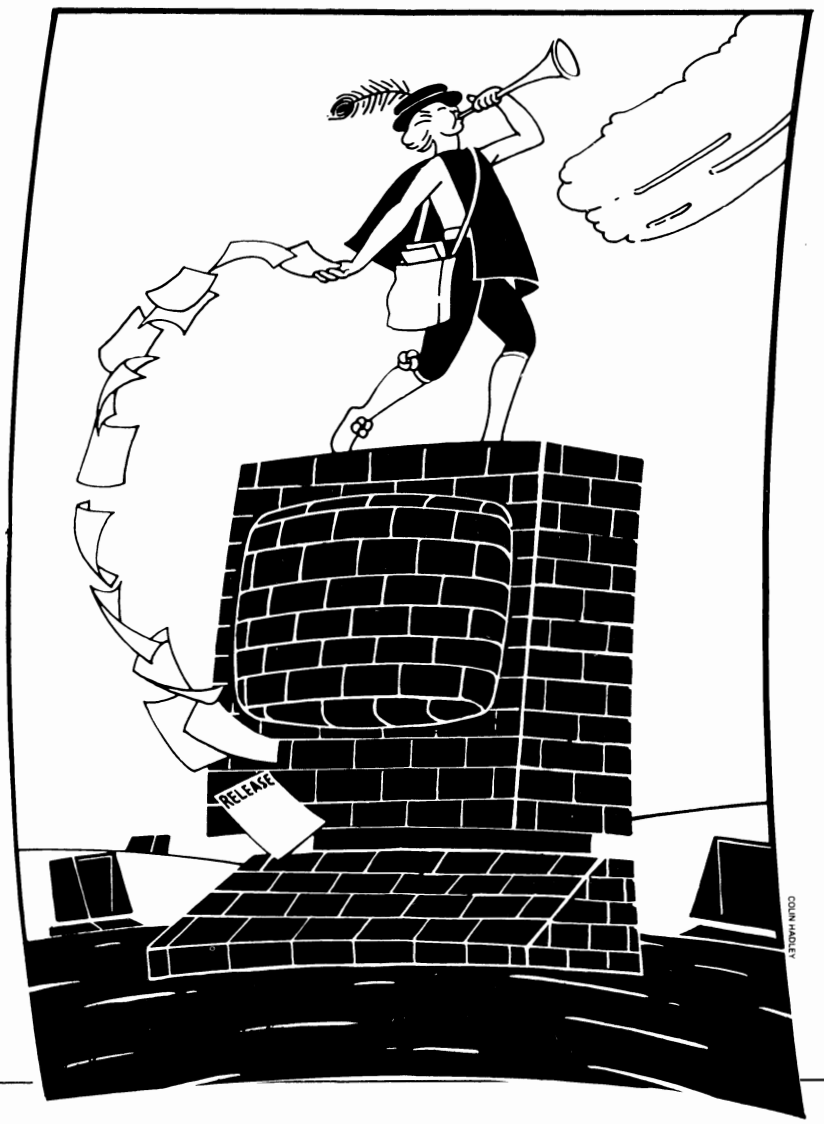
So what can PR offer the micro or OEM company? In a nutshell, the chance to have its services or products shine out above others; the chance to expose its services or consultancy skills to potential customers in a far more credible and cost-effective way than 'straight' advertising; the chance to get ahead.

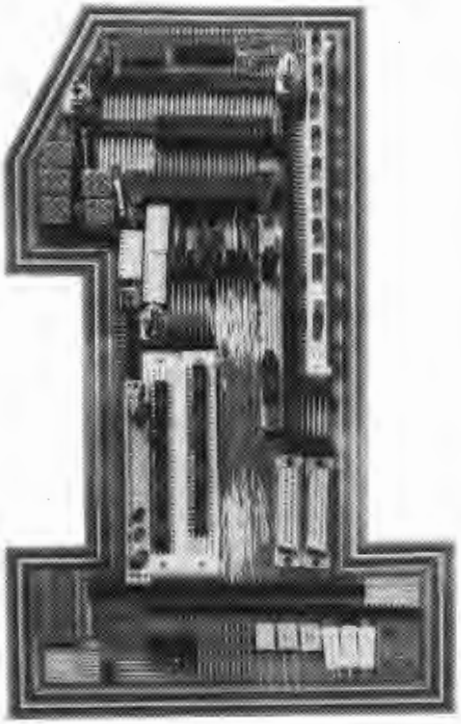
Perhaps nowhere is PR needed more than in the micro/OEM business. Just consider that there are well over 200 publications in Australia at present concentrating themselves with micro technology to a greater or lesser extent and something like three-quarters are read by potential first-time micro users. Choosing the right computer system can be a harrowing experience for the first-time buyer. All too often, they are bombarded with strange, meaningless jargon with constant references to minis or micros, bits or bytes or any other technical terms. Good PR can help to explain in everyday language how computer systems can help a business to achieve greater efficiency and become more cost-effective.

In practical terms, an efficient PR person can take a sales specification brochure littered with 'Americanese' technical jargon and translate it into a new product news story for an office or business equipment magazine. In the case of the client having a successful systems installation, the PR arm can research and produce an article geared to the relevant target media.

SPECIALIST PR

But even when a company or industry recognises that its problem is no longer

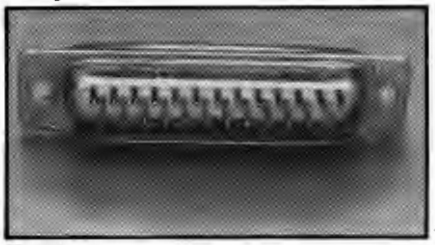




No.1 for any bits.

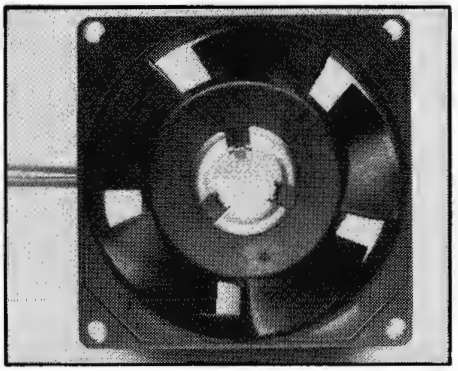
In the electronic component field today, being No. 1 is tough. At the new Ampec Trade Shop, we already have a No. 1 address . . . and No. 1 service and prices . . . and always the No. 1 products. Quite simply, we want to be No. 1 with you. Here are some of our current specials available while stocks last — prices do not include sales tax.

Digital Multimeter
3½ digit LCD multimeter with 10 amp range. ME 531 — *$45.00*



D Connectors

ADIN — 1S — 25P	*$1.91*
ADIN — 1S — 25	*$2.82*
ADIN — 1S — 9S	*$2.49*
ADIN — 1 — 9P	*$1.89*
ADIN — 15S	*$3.51*
ADIN — 15P	*$2.52*

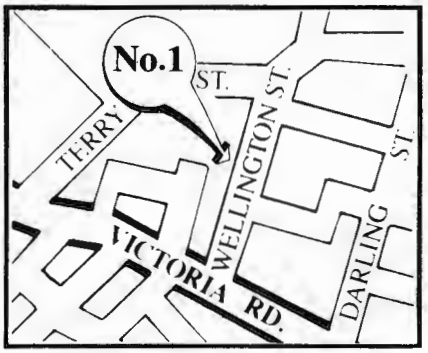


Fans
4″ fan —240V EP114-38 *$11.00*
3″ fan —240V EP 75-38 *$11.00*

These prices while stocks last — sales tax not included.

The Ampec Trade Shop

No. 1 Wellington Street, Rozelle, NSW 2039
Phone: 818 1166



AMPEC
The absolute in peripheral thinking.

being aware of the need to communicate, it is still up against the problem of knowing what to communicate, to whom and how. It is at this point that many firms run foul of PR. Companies large enough to want PR assistance, but not of a size to warrant an in-house staff, often have a very unclear idea of what PR can do for them. Unsuspectingly, they often drift into the ever-open arms of a large consultancy.

> PR is very much dependent on a two-way flow of ideas.

David O'Leary runs a small agency specialising in technical PR. He recounts a recent business pitch. "The managing director said to me apropos of a well known consultancy he had employed, 'They were very good – very good at sending their invoices!' He claims that they had almost no contact with the company, instigated press releases only when they were given information, and that their only constructive action was to organise vastly expensive and fairly ineffective press lunches and launches.

"I don't doubt his story," O'Leary continued. "PR is an activity which, by its nature is hard to quantify, except on the old column inch yardstick – and that can be an illusion. Certainly, you can get conned very easily and I think his story reveals some of the major factors that can lead to dissatisfied clients and surrendered accounts."

BASIC CRITERIA

So what basic guidelines need to be given to a firm, possibly considering using PR for the first time? Having given the brief to two or three agencies, how should their proposals be judged? Here are six criteria that should lead to a fairly shrewd assessment and conclusive impression of the agency which should be entrusted with your account:

1. Does the proposal show a real grasp of the situation and PR problems/opportunities?
2. Can the agency demonstrate its ability to understand technical information and translate it to the layman?
3. Do the recommendations look fairly standard or do they point to a considerable effort and some basic research relevant to your specific problem?
4. Is the team that has been put forward for working on the account competent and qualified to carry out its recommendations?
5. Does the timing and inherent planning of the programme to be executed seem realistic?
6. Are the fees proposed realistic (or too high or too low)?

You should not treat your agency as a 'post office' by taking the line that if, for example, there are releases and articles to be written, only someone in your own firm knows enough about the business and the appropriate phraseology to prepare them. Make sure the agency familiarises itself thoroughly with all sections of the company, then agree on work priorities and secondary objectives. Then let it get on with the job.

The cardinal rule is not to let the agency work in a vacuum. Check at least once a week that the programme is being worked on according to plan (some clients prefer daily telephone contact) and summon a meeting, ideally at the plant, at least once a month to review progress and agree to work programmes for the following month.

The important thing to bear in mind is that success in PR is very much dependent on a two-way flow of ideas and on frequent stimulus. Keeping in close touch, at least during the early months of a campaign, is crucial. Monitor performance against set objectives and work programmes and, after the first six months or a year, evaluate the effect of the campaign. If all the right things are being done, it should be working for you.

There is no reason why PR shouldn't work for the micro house as well as it does for a baby food producer. Given the right client/agency liaison, PR needn't be wheeled out of the cupboard only when there's a crisis!

Many executives seem to confuse press relations with PR. Journalists constantly bemoan the fact that PR companies are there as a block between them and the executives they want to contact. It is not really the job of public relations to act as purveyors of alcohol to the fifth estate.

Unfortunately the PR industry has suffered from a bad reputation among pressmen because of the old school tie and gin and tonic brigade who imagine they can smooth over an investigative reporter's ardour with a slap-up lunch.

A good PR firm should act to facilitate communication between the press and their clients. It is unfair to expect a PR company to guarantee you press coverage or to expect them to have press releases printed verbatim. These are editorial decisions that rest with editors alone.

If a PR firm is respected by the press for acting professionally they are more likely to respond to bids for publicity.

Fobbing off reporters to a PR firm which does not have the information the press wants engenders bad feeling between your company and the press.

If a reporter contacts you for information it is because you are in a position of authority to respond. If you choose to direct the enquiry to your PR firm you are likely to lose the opportunity to make a comment as the reporter will not want a rehearsed statement.

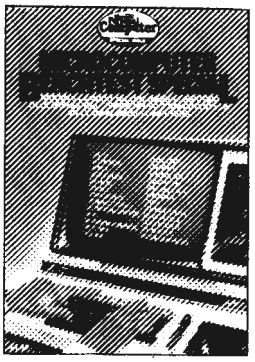
People who are nervous about their reputations generally end up without a reputation, either good or bad.

END

Australian Personal Computer
SPECIAL ISSUE

MICROCOMPUTER BENCHTEST SPECIAL

AUSTRALIA'S LARGEST SELLING MICROCOMPUTING TITLE BRINGS YOU COMPREHENSIVE BENCHTESTS ON 21 LEADING MICROCOMPUTERS



AUSTRALIAN PERSONAL COMPUTER
AUSTRALIA'S LARGEST SELLING
MICROCOMPUTING TITLE BRINGS YOU
COMPREHENSIVE BENCHTESTS
ON 21 LEADING MICROCOMPUTERS
IN ONE COMPLETE VOLUME
USE THE COUPON BELOW TO ORDER
YOUR COPY OF APC'S
BENCHTEST SPECIAL

PLEASE SEND ME ..... COPIES OF APC'S BENCHTEST SPECIAL. I ENCLOSE $3.80 PER ISSUE TO BENCHTEST SPECIAL OFFER, P.O. BOX 280, HAWTHORN 3122. CHEQUES SHOULD BE MADE PAYABLE TO – AUSTRALIAN PERSONAL COMPUTER.

NAME.....

ADDRESS.....

..... Postcode.....

Network builders, here's your perfect partner.

Once you get to know the new B20 range of microcomputers you'll want to say "I do".

The B20 is ideal for networking. Local or remote. B20 microcomputers can be linked together – up to 17 in a cluster – and each microcomputer can have up to 512K bytes of memory. Each microcomputer can execute its own interactive application program using its own disk, printer or data communications. Each microcomputer can also share the resources of the master B20 in the network.

B20 Highlights

The B20 offers a wide range of communications protocols which provide it with exceptional versatility for its size and price.

Its disk capacity can expand from 600Kb floppy disk to 60Mb Winchester.

The B20 offers a wide range of software, including Word Processing and Multiplan,* a new, advanced electronic worksheet that's one of the most powerful modelling and planning tools available.

B20 Data Manager

But perhaps the most outstanding software available on the B20 is its Data Manager application generator. Data Manager is designed to simplify and accelerate the process of creating programs so reducing the time taken to implement new systems. With Data Manager the advanced hardware of the B20 has a perfect software partner.

Partners in Success

Choosing any data processing system is very much like marriage. Because once you order it, you've formed a long-term relationship with its supplier.

That's why one of the B20's biggest assets is the company behind it. Burroughs has 95 years experience in managing information for businesses – from the smallest to the largest. So you can depend on the B20 to come with strong, knowledgeable support. Worldwide service. And a total solution that can make networking more productive for you. For more information on the B20, call Jon Matthews on (02) 922 9300.

*MULTIPLAN IS A REGISTERED TRADEMARK.

Burroughs

Building on strength

BUR0056

CHOOSING A DATABASE

A database in principle is simply a collection of data – for example a daily diary is a database of activities over a period of time. Database material is stored on a computer in a particular manner so it can be interrogated in a variety of ways.

All programs which process data on a computer could be called data management systems, since they all process or manage data. Here, though, we shall be talking about those packages whose *main* concern is with managing information – checking it on input, storing it, retrieving it for display at the terminal and using it to create printed reports. There are dozens of packages on the market which aim to allow the end user (rather than the computer buff) to tailor a system to meet particular needs for a set of personnel records, stock recording system, register of houses for sale, etc. This article will set out some criteria to use when deciding if a particular data management system will meet the user's needs in a small business or the like – where the volumes of data are likely to be rather larger than in a typical home application.

In this article we'll look at the limitations imposed on the user: the facilities provided for storage, retrieval, security, tailoring to meet particular needs; the ease of use and friendliness of the system; stability and reliability of the system and its supplier; and the costs -- obvious and hidden – in implementing the system.

System limitations

Most packages put limits on the numbers and sizes of files which may form part of the information management system, either globally or in simultaneous use. These limitations may not make it impossible for you to do particular things but they may affect your approach. For instance, if you want to keep all your stock items on a single file you may find that the total amount of information will exceed the size of file allowed, and you will be obliged to split your records into two or more files.

The extent to which you can link files together is also important. For instance, in our stock/supplier example, one solution would be to allow both files to be read at the same time, with information from the two being merged. Another would be to select from the stock file all the required items, keeping a separate list in the computer's memory of the supplier code for each selected record and then using that list to select the supplier records from the supplier file. If you can neither read two data files in harness nor link them indirectly, you could still achieve your purpose by keeping the supplier's name and address on each product record. But this would give you an extra 150 characters or so in every product record, increasing search times and perhaps bringing you up against the limit on total file size. You would also need to keep this name and address information on your purchase ledger, and change it in both places if the supplier moved premises: more wasted storage space, and — even more important — greater danger of error in updating, or of forgetting to make the change everywhere the data item occurred.

Most systems also have limits on the size of a record, and of a field within a record. Only by having a fairly clear idea of what you want to do can you decide before you buy whether these constraints will affect you in practice. A hidden problem in this area concerns record structure. If the system requires all records in a file to have the same structure, then records may sometimes become unnecessarily long. For instance, a file consisting of records about cars might include some data on their gearboxes which differed in structure for cars with manual and automatic gearboxes. Since no single car will have both, a sensible system would allow the alternative information to occupy the same position and space in the record — but in many systems you would have to have space for both kinds of information in each record. A similar problem concerns variable amounts of information: records about a family for instance, might include several fields of data about each child, where a family might have no children, one, two or more, etc. In most systems, you would need to allow for the maximum number of children there is ever likely to be, so that most records would contain much empty space, wasting storage capacity.

A final point on limitations relates to accessing information. To retrieve particular records, you will want to be able to specify search criteria of varying complexity; for instance, to find all the houses for sale in Mosman with two garages and a swimming pool, you would need to be able to search on three fields – location, number of garages and presence or absence of swimming pool. Some systems allow searching only on a single field, and have to use trick methods to search several fields. Others allow such searches only on fields you have specified when you set up the file, while others again give you fast searching on a single field and use slower methods to search on subsequent criteria.

It is often hard to discover exactly a system's limitations. They should be clearly set out in the documentation; if not, you may find such reserve a good indication of the standards of professionalism of the software as a whole.

Data storage facilities

Before you can get data out, you must put it in. This involves creating a file of records in the first place, keeping those records up to date and adding new records as necessary. The data management system can help in two main ways. Firstly, good systems provide methods of formatting the terminal screen to make it easy to provide the information needed and make good use of keyboard facilities such as cursor controls. Secondly, good data checking facilities (ie, to prevent the user entering alphabetic characters in a field meant only for numbers) help a good deal in getting the data right. This applies not only when creating records but also when updating them — by requiring confirmation it ensures that the record to be changed is the one the user intended, for example.

All this assumes that the data is being entered from the keyboard. Sometimes the data may be in the computer already and perhaps just needs incorporating in another file, or reformatting; it can be very helpful if the data management system can read files of data created outside the system itself by other programs, such as your accounting suite. (You may also want to write to files which such software can read, thus integrating your information processing activities to prevent waste and duplication.)

Pitfalls to watch out for when updating include restrictions on file size, which may affect how many new records you can add, and constraints on changes to record structures, which may prevent you adding new fields to existing records.

Data retrieval facilities

Occasionally you will want to get all your data back in just the order you put it in but usually you will want to select parts of it. This may mean selecting some fields from every record, or every

Catherine Denwir

field from some records, or some fields from selected records. To select some records from the file, the system must either read every record to decide whether it is needed or not, or else be told in advance how to make such decisions to provide a more efficient method of selection. Because it takes a comparatively long time to read each record in turn, most systems use a form of indexing.

Some systems allow only one field to be used as the key for indexing, while others permit several, which may have to be specified when you set up the file — more flexible systems allow you to specify fields later. Frequently a key field has to contain unique information, so one may index on, say, the names in a telephone directory only if each person's name appears only once, and must use a modified form of the name to make each name entry unique if there are duplicates. Of course indexes are only useful if they are kept up to date when the data file changes, and in some systems this is not done automatically — you must ask for a new index to be made after each set of changes to the data file. Even if indexes are updated automatically they will eventually become less efficient and need reorganising. You should try to get some idea how often such reorganisation is needed and how much time — yours and the computer's — will be needed. Another difficulty to watch out for here is any restrictions on space allowed for indexing, which will of course need to increase as the data file grows and with any growth in the number of fields to be used as keys.

Some data fields will have values which cause the record to be selected on the basis of the presence or the absence of the value — for instance, a telephone directory entry either relates to a particular person or it doesn't. But there are several other kinds of selection you may wish to make. A common requirement is to extract all records relating to a particular time span — all orders issued in the last month, say — or you may perhaps wish to find out which of your customers owe you more than $1000. Frequently it is necessary to combine several selection criteria, as in our house example. Data management systems vary considerably in their flexibility and power in this respect.

Having specified the records you want, the package may give you a choice about how they are displayed. Some systems allow you to show the records with equal ease on the screen and as a printed report, while others have only limited facilities for screen selection and display and require you to create a file of specifications to 'batch up' the more complex criteria. Either way, you should have some choice about the way printed reports are shown, with user-supplied headings and format specifications. The best systems supply simple layouts which you can use unmodified to start with, and then adapt to your own needs. Whether on screen or printer, the system should allow you to manipulate the results — perhaps totalling all the entries in a particular column, or using one entry to modify another — and should let you specify that the records should be sorted in a particular order before they are displayed.

Security

As far as *human* error is concerned, security is involved both with the right people doing the wrong thing by mistake, and with anyone doing the wrong thing deliberately. Errors may involve

THERE'S NOTHING LIKE GETTING YOUR HANDS ON IT!

Australian Personal Computer is the largest-selling microcomputer magazine in Australia. We must be doing something right. But even *APC* has its limitations.

Touch the keys in the picture. Nothing happens, right? There just isn't any substitute for hands-on experience of new and exciting machinery and software.

The 1st Australian Personal Computer Show next March will be the largest and most exciting microcomputing exhibition ever held in Australia. Almost every big name (and a lot of smaller ones) in the microcomputer industry will be represented. Features will include the very latest software and add-ons for popular machines, computer chess competitions and an opportunity for you to challenge a micro to a game of Scrabble.

From the business angle there's more demonstration machines and business software than you could get to see in a year at your own office. But you needn't risk divorce to evaluate them . . . your wife (or husband!) and the kids can be looking at the vast array of home and educational micros on one of the other stands.

In short, The 1st Australian Personal Computer Show will have something for everyone to get their hands on. Can you really afford *not* to be there.

The 1st Australian Personal Computer Show

Centrepoint Sydney
10-12 March 1983

For further visitor and exhibitor information about The 1st Australian Personal Computer Show, please contact Rachel Tetley, Australian Exhibition Services Pty Ltd, 1250 Malvern Road, Malvern, Victoria 3144. Telephone: (03) 20 1208. Telex: AA 39329.

updating the wrong file, or making mistakes when changing a record. The system should be able to provide checks, such as the data validation we've already mentioned, to minimise the risk of mistakes occuring. 'Doing the wrong thing deliberately' may simply mean gaining unauthorised access to confidential records, or it may go as far as positive fraud — perhaps by falsifying payroll records. Some systems provide password protection on important files, and sometimes on individual records as well. So much for prevention: detection of human error (unintended and deliberate) and recovery from it may be possible if the system keeps records, known in some contexts as audit trails, of what changes have recently been made to the data.

The package should aslo have some protection against *system* errors. For instance, when a system is used by several people it should not be possible for two users to change a record simultaneously. The system should also keep a journal of its own activities, so that if the system fails for any reason information is not damaged beyond recall. Ideally, there should be some way to repeat the activities being undertaken when the system failed.

Tailoring the system

Every data management application will involve tailoring the system to your requirements; how much will be possible and/or desirable will depend on the system and on your needs. First you must describe to the system the nature of the data. Once described, the way in which the data is input may be specified completely by the package, or the user may be able to adapt the user image to the needs of his application. The most obvious adaptation is to design the screen display to make it easy to enter data quickly and acccurately. But data management systems can permit much greater adaptation of the user image, allowing the user to present selection menus or to set up detailed messages for novice users. It should also be possible, within the limitations of direct instructions in the package's own command language, to specify a range of calculating and manipulating functions. Often, too, you will want to carry out the same sequence of actions many times — every day or week, perhaps — and a system which allows you to use some kind of shorthand to initiate the sequence can both save you time and prevent errors. Finally, there is a limit to the amount of flexibility any system can allow within its own command language. You can gain even more flexibility if the system allows you an interface with another program, either one written (in Basic, Cobol or whatever) by the user or to his specifications, or else to another general purpose package. The latter is most likely to be one which will process the results further; for instance, you might want to use a word processing package to write circular letters to all those customers who owe you more than $1000. A link to such a package means that the data management system need not duplicate these facilities itself.

Ease of use

Probably the most obvious aspect of this is the image the system presents to the end user — the person who has to design the data structures and sit at the terminal entering the information. A good system will make it easy for the user to tell the system what is required of it, enter correct information and recover from errors. You should remember, too, that users change as they get to know a system; the user image should be adaptable, so that an experienced user can make use of his knowledge to take safe shortcuts through the detailed instructions needed by the novice.

Where a system has more than the most rudimentary facilities for tailoring to meet particular needs, especially if it can be interfaced to user-supplied programs, different considerations arise. Usually the biggest problem is finding out enough about the internal working of the information management system to be able to hook in one's own program. This usually has to be gleaned from the system's manual, and a close look at the documentation should give you a pretty good idea quite quickly about how helpful the package is in this area.

However helpful the system is to the end user when at the screen, he too will need to rely heavily upon the documentation. Sad to say, the quality of most computing manuals ranges from barely adequate to appalling. Pointers to look for include the amount of computing jargon, the size and adequacy of the index and the clarity with which the manual is laid out. Plenty of diagrams, simulated drawings or photographs of the screen displays and lots of examples of practical applications all help to make technical manuals more intelligible. The quality of the user documentation is usually a good indication of the amount of thought and effort which has gone into the user image as a whole.

Some suppliers give training in the use of their software, so that you may not have to rely wholly on the documentation to learn about the package. Such training is likely to be oriented solely towards acquainting the user with the software which is supposed to solve his problems. Of course, you must have some knowledge of the system in order to be able to use it, but such a 'solution-oriented' approach is not enough by itself. The user starts with a problem, and may need help to see it in terms to which he can apply the solution provided by the information management system. If you can find someone — another user, the supplier if he is a good one, a consultant who will help for a fee — who can help you find answers to all those questions which begin 'How do I. . .' by taking a 'problem-oriented' approach, you stand a much better chance of achieving your aims with the system than if you just try and muddle through by yourself.

Stability and reliability

Obviously, a system that is to hold important information needs to be reliable. The more users a system has, the longer it has been in use, the more likely it is that the system will be reliable. But bugs will occur — you may not come across them, if you're lucky, but the only bug-free program is one that's no longer in use — and it's important to find out what arrangements there are for reporting faults, and how, as well as how quickly, errors are put right. If the system is still being developed, because it's widely used and popular and people keep requesting enhancements, it's worth checking how such improvements are marketed — do you have to buy a complete new system if you want the new features? Will data stored under earlier versions still be usable by later releases of the software? (If the system is still being developed in order to give it basic facilities, treat it like the measles until it's been around a bit longer.)

Costs

As well as the straight monetary cost of the system itself, there are two other areas to consider. Data management systems can be quite demanding of computing resources, especially processor power and disk storage, so it's important to check properly that the system will run in reasonable time on the computer on which you plan to use it. An important consideration is the amount of trial you can give the system before you buy it. Many systems have a dealer demonstration pack which is free to suppliers, but which can only show a very small set of data in use — typically five or ten records in a file. With such small amounts of data any system will run quickly. If you can, get the supplier to show you a more realistic demonstration. The dealer packs are sufficient to show the supplier whether the system is worth taking seriously, but any dealer worth his salt should be prepared to buy a full copy of the system to demonstrate its facilities properly and to enable him to become sufficiently acquainted with it to deal with his customers' queries.

Remember, too, that while you may buy data management software for a particular purpose, the chances are that if it's successful in its first application you will want to implement others; find out about how easily the system can be extended and how much such enhancements might cost. The other costs involved will be your resources — the time and effort needed to set up and run the system. This is probably the hardest cost to estimate but if you don't do the implementation thoroughly, the system will be a failure however good its potential facilities.

What next?

In this and following issues, the selection criteria outlined will be used to review a number of data management systems. A data management system is likely to be at the centre of most business computing and it's worth taking time and effort to get the right system because that system will have a big impact on your subsequent computing development. The aim of this article and of the reviews of particular systems which will follow, is to help you to get that decision right. END

The 1st Australian Personal Computer Show

SELL OUT

SHOW PREVIEW

Two months to go! All the available space at Centrepoint has now been sold and it's certain that the 1st Australian Personal Computer Show will be the most exciting industry event ever held in Australia.

1982 signalled the entry of many computer giants into the once spurned micro industry. Not the least of these is IBM who have taken a large thirty-six square metre stand to exhibit the IBM *PC*. DIGITAL EQUIPMENT (king of the minicomputer industry) have taken an equally large stand at which there'll be their newly released range of micros including the Rainbow featured on last November's *APC* cover.

DICK SMITH ELECTRONICS will of course be there with the popular System 80 and VIC-20 micros but, according to Dick Smith, the star of their show will be the Dick Smith Wizzard which is a TV game with a personal computer option.

The Epson HX-20 (reviewed last month in *APC)* will be on WARBURTON FRANKI'S stand as will the Epson's CP/M desk top business micro, the QX-10. It has twin 5¼ thinline floppies, 128k of RAM, two DMA controllers and usual ports.

The 80 column screen for the OSBORNE computer will also be able to be seen (if you squint – sorry Osborne) which along with the 10Mb hard disk option should greatly increase the machine's popularity.

PRESIDENT'S IBM *PC* look-a-like, the Columbia, will be on display featuring full colour monitor and 10Mb hard disk and the Kaypro will also sport a hard disk making an all up software/hardware portable system for around $4895 (ex tax).

The COMMODORE 64 will have its first show appearance. It's superficially similar to the VIC-20 but with 40 characters per line and several other enhancements. It should sell for around $799.

SANYO will be featuring two models, the MBC 3000 word processor and the MBC 1000 microcomputer with add-on hard disk, multi-terminal and running Sanyo's SSS software (Sanyo System Solutions).

BARSON COMPUTERS, the Australian distributor of the Sirius, will be showing the 10Mb Winchester, the BBC micro and "God willing", the Sinclair Spectrum.

THE COMPUTER COMPANY will of course have the JB 3000 and will launch a full range of peripherals for this 16-bit machine. Also Panasonic's answer to the VIC-20 will be launched.

NECISA is now going full steam with their APC (Advanced Personal Computer), which again is one of the new 16-bit machines. And you'll be able to find out exactly how the PC8000 can help cut costs to the bone in a sandwich shop.

The HITACHI "Success" could be the success of the Show, a graphics terminal coupled with a compact drive unit and processor. We've been waiting for it.

Many other exhibitors will be jostling for a market share. TEXAS INSTRUMENTS, SIGMA DATA, CASE COMMUNICATIONS, TANDY, ADLER, ANDERSON DIGITAL, SHARP, DICKER DATA, ELMASCO, IMAGINEERING, MAGMEDIA, MEMOREX, APPLE, HEWLETT PACKARD and many more.

The USER GROUPS have been gearing up and have on hand all the good information for prospective members. User groups are a good way to keep in touch with others using similar machines.

The AUSTRALIA COMPUTER SOCIETY (ACS) has endorsed the Show and is having a top-level Personal Computer Conference program to coincide. International guest speakers are coming to Australia and will be speaking on a variety of subjects designed to appeal to a broad profile of existing and prospective microcomputer users.

There'll be a large amount of new micro literature available at the Show. Indeed, the publishing industry seems to be almost as much in evidence as the microcomputer industry! Most of the major publishers will be represented, including MC-GRAW HILL BOOK CO, TECHNICAL BOOKSHOP, PETER ISAACSON PUBLICATIONS, ADDISON-WESLEY PUBLISHING CO, AUSTRALIAN AND NEW ZEALAND BOOK CO, COMPUTERWORLD, ELCOMP-HOFACKER and the POCKET BOOK SHOP.

Of course AUSTRALIAN PERSONAL COMPUTER and AUSTRALIAN BUSINESS COMPUTER will be prominently featured, and on sale.

There will be lots of pretty girls, lots of colour computers and if you're not there you will have missed one of the most exciting events since the beginning of the Information Revoloution.

MORROW DESIGNS

MICRO DECISION

DECISION ONE

Factory trained representative

AUTOMATION STATHAM

47 BIRCH STREET, BANKSTOWN 2200
Telephone: (02) 709 4144
Telex: AA 73316

PRIME GETTING PERSONAL

by John Thompson, MD, Prime Computer (Australia)

Most dataprocessing managers would not have been surprised with James Martin's statement that the applications software backlog is typically about three years. It is no wonder that individual managers and departments are going their own way with micro or personal computers.

The frustrated manager has seized the microcomputer and is enthusiastically creating his own systems in an attempt to get the answers he needs to keep pace with the contrary business environment of the eighties. In some organisations the data processing department has even given a half-hearted nod to the trend to give itself a little breathing space.

But is it the real answer? Whilst it does help the short term goals of a particular manager getting his own pet application going, it is not necessarily in line with the long-term needs of the corporation.

There is an alternative approach to personal computers, it is called personal computing, it sounds almost the same but there the similarity ends. One needs to explore the ramifications of both approaches.

There is no doubt the manager needs to have his or her own computing capability to handle the job effectively. He needs to have access to his own small applications to handle a budget or cope with a loan calculation exercise, for example.

He needs to have the ability at his desk to conveniently write small applications and to modify and extend them. The tasks are simplified by the availability of application programs such as accounting packages, discounted cash flow packages, inventory optimisation packages.

But so far as the personal computer is concerned as a free-standing unit, that is about the limit of it, because he is limited either to writing his own or using an application, and ultimately both of these have limitations.

What the manager really needs to do, and this is one of the fundamental tasks of management, is to communicate. This is also one of his most difficult tasks in the sense of getting and giving information.

To effectively get and give information he needs to be able to communicate with major functions both inside and outside his company. He needs to have ready access to corporate information such as pricing inventories, and financial data. He needs to transmit some of this information to other people inside and outside his company, both in the same building, interstate and perhaps overseas.

Here he confronts the first major limitation of personal computers. It can help him do the work that is on his desk, but the effective getting and giving of information can only be handled if his computing capability is part of the overall computing capability with all its communications facilities. If his computing device is part of a network he can communicate with everybody.

As part of a network he has access and interaction with corporate information in addition to what is loosely described as Office Automation functions, with all the benefits of personal and interpersonal time management and communication.

Everybody plays telephone tag these days, yet an electronic message intray means that the communication is in train at the first attempt.

The sophistication of today's data management tools at the same time ensures that it is possible to jealously guard the security and integrity of corporate information.

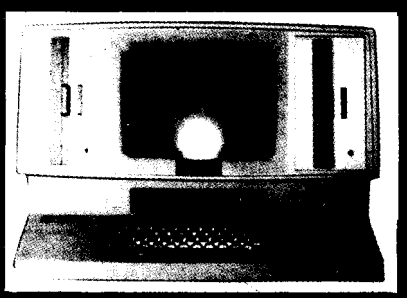
Meantime what is happening to our friend with the personal computer? He has gone to a great deal of trouble to gather his information and fashion his application, he too is concerned about security, so he carefully locks his diskette away in his drawer or clutches it in his briefcase. But what about the other people within the organisation who could benefit from his personal information?

He has invested a great deal of his valuable time in perfecting his system, but who else can benefit from those innovative little applications he has sweated over on his own personal computer? When his hard-earned promotion arrives, where are the driving instructions, and documentation, and help functions to enable other people to benefit from his investment? In fact they don't exist. If he leaves the personal computer behind, his successor can just get on with the job of reinventing the wheel all over again.

If our personal computer user migrates to a position in a company

Century Computer

"YOUR BUSINESS COMPUTER"



Model C800-S (Price $4950 + S/Tax)

* Accounts receivable
* Accounts payable
* General Ledger
* Payroll
* Order entry/ Invoicing
* Sales Analyses
* Word processing
* Mailing
* Doctors Office
* Dental Office
* Real Estate
* Nursery
* Customs Agents
* Manufacturing

Distributed by:

abacus

512 Bridge Road, Richmond, Vic 3121
Phone: (03) 429 5844

changes the micro's memory into the equivalent of a large sheet of gridded paper 63 columns wide by 254 rows in depth. Where a row intersects with a column it creates what is known as a cell. This gives 16,002 individual cells, each of which can be identified in a way similar to chess notation, for example, A1, P48 and so on.

Just as the Osborne's own screen can be scrolled to create a window onto information that is out of sight, so SuperCalc allows the user to travel backwards and forwards across the full expanse of the spreadsheet. The screen can also be split, so that one set of figures can be directly compared with those from another area of the spreadsheet.

In this SuperCalc is very similar to a lot of the other packages such as VisiCalc and CalcStar. However it does have one important innovation – it incorporates a special data protection feature so that certain key areas of information cannot be accidentally over-written or erased. When dealing with several hundred individual items of information, this is certainly a valuable feature to have on your side.

I decided that my project would be, appropriately enough, to prepare a financial model showing budget and cash-flow projections for the coming year for launching a new microcomputer shop.

For convenience the company would initially be run by two directors, but sales and technical support staff would be taken on later. I also decided that my hypothetical company would primarily sell medium-priced microcomputers along with business software, stationery and various other ancilliary benefits.

I therefore wanted a system, to relapse into jargon for a moment, that would be parameter-driven so that the effect of changing any one item of fixed or variable cost would automatically be incorporated into the whole spreadsheet so that I could see, for example, whether I could afford to employ another salesman or give myself an increase in salary. In particular I wanted the data that was to be the basis of my budget and cash flow projections (which are crucial figures as bank managers tend to base their decisions as to whether they are going to lend you any money on them) to be drawn directly from my parameters rather than calculated and recalculated individually.

I began simply enough by naming my columns and rows. The columns I defined as time periods of months, while the rows I intended to be my items of income and expenditure. Initially this was quite straightforward, I started with directors, their salaries, any planned salary increases, their rates of commissions, their car running costs, their sales quotas and so on. I then carried out a similar process for planned salesmen, technical and customer support staff.

After this I set about on my anticipated revenue from sales, which I hoped would give me a gross profit figure of total sales less cost. After this it was my intention to itemise my total expenses from my overheads, such as rent, printing, heating, and so on, to produce a figure which, when deducted from my gross profit, would give me my overall profit and loss figures for the year.

At least that was my intention, but I soon discovered that while it was one thing to feed into cell D7 that my salary for January 1983 would be $1,000, it was a completely different matter when it came to feeding in values for cells that depended upon the values expressed in other cells.

For example, to calculate the total wages figures for January in cell D68, I had to take into account my total number of salesmen, customer support and technical support staff plus their wages and any increases they might have received. This figure could have been calculated with a pen and paper, but it would have had to have been duplicated for each month of the year, as well as being revised every time one of the parameters changed. For SuperCalc it was therefore essential to define the wages figure as a formula based upon information and values the program had already been fed. In this case the formula for cell D68 was (D16 x (D17 + D18) + ((D26 x (D27 + D28)) + ((D36 x (D37 + D38)).

As can be readily appreciated, it obviously helps if you can remember your algebra from school days and this formula, I am sorry to say, was one of the simpler ones.

As far as I am concerned, having to feed in the correct formula is the greatest drawback of using the SuperCalc level of financial planning program, because, before you start changing variables around to see what happens if the rate of sales tax increases by 5%, you have to devote a considerable time to working out the logic behind your model.

In turn this means that before you even switch on the computer you have to sit down with a very large piece of paper and plenty of pencils and start to construct the logical framework around which your model will eventually operate. SuperCalc and programs like it are superb 'number crunchers' and will juggle figures about whichever way you like. But they cannot work out the principles upon which they are juggled. You have to do that by yourself.

In my own case I must confess to cheating and using some assistance from a financial planning consultant. Without his help however I estimate that it would have taken me about a week of fairly continuous work to have devised the logic behind my model, which to this day still has some flaws in it.

While preparing my eventual total of 129 rows and 15 columns of data, I encountered a number of other foibles of SuperCalc-type software.

For example, cash flow figures are not merely a simple matter of transferring sales and expenditure values from the budget end of the spreadsheet down to the inflow/outflow section. You also have to take into account the different payment periods for your suppliers, which in the computer trade can vary from 7 to 90 days, and the different credit terms and discounts you offer your customers. The problem is these differentials are not immediately apparent from the budget projections and so a separate set of logic and formulae have to be devised. On one occasion, for example, I found myself faced with the formula: (((154 + 155) x 0.25) + ((G54 + G55) + SUM (G56...G59))) x 1.15. All of which neatly pinpoints the need to ensure that you put your pairs of brackets in the correct place – which is not all that easy to do when you are working onto a VDU screen, whatever size it is.

Possibly one of the most glaring weaknesses of this type of modelling program is its handling of bank interest. All electronic spreadsheets work on the basis that calculations flow down from the top left to the bottom right. Thus items appearing in the budget section, which should be a true record of the income and expenses of a company have their counterparts in the cash flow section.

But this is not the case with bank interest for, although it is undoubtedly a legitimate expense, it cannot be predetermined until you have calculated the total outflow of funds as obviously you only pay bank interest on an overdraft. Thus, instead of the cash flow items drawing on the budget section for their raw data, the reverse happens and a budget item draws from the cash flow section.

To take this phenomenon into account you simply have to process the whole spreadsheet through an extra recalculation. But a further problem arises because bank interest is levied not only upon the principal, but also upon any existing interest. Thus, when the figures are recalculated, the bank interest item in the cash flow section is itself subject to a further recalculation to take account of the extra interest due on the interest just logged in the expenditure section. The result is that you find yourself getting into an endless loop with bank interest with each recalculation giving rise to further recalculation.

With one of the more sophisticated programs like Micromodeller, I could have probably devised a way to circumvent this problem. As it was I cheated and wrote my formula in such a way that the bank interest item took no account of existing outstanding interest. On the model I was using the loss of accuracy I suffered was annoying but made no real difference to the final figures. However, for anyone in a business involving vast amounts of bank interest, such as some major construction project, this inaccuracy would be intolerable.

Having completed the logical framework of my model, I was home and dry and could really start using SuperCalc in its 'what if' mode to test what would happen if certain key parameters were shifted. For example, I calculated the effect of changing my trading terms with my major supplier, so that instead of getting a 25% discount if I paid in 60 days, I got a 30% discount but only 14 days credit. By using SuperCalc I spent a couple of minutes programming in the necessary formula changes and then had to wait about another 90 seconds while the Osborne did the necessary recalculations. Armed only with a calculator, that calculation would have taken me the best part of an afternoon.

Recalculations of this type revealed another incidental advantage of using a

Helping the business world communicate

Reduce your business communication costs

WhisperWriter

The introduction of the 3M Whisper Writer System signals a revolution in business communications. Whether disseminating monthly sales reports, "TWX"ing a message to a supplier, communicating with your sales organization, entering the day's orders or checking the latest quotation on your "hot tip" stock, this remarkably efficient teleprinter system meets your varied business communication needs . . . right now.

Compact and quiet, the Whisper Writer is at home on a desktop or small stand, but can go just about anywhere if need be. No special installation is required – the unit plugs into standard voice telephone jacks and can even share the line with a regular phone. The direct phone line connection provides automatic answer and unattended reception of communications.

On the road, the Whisper Writer is packaged in an attractive executive briefcase. An acoustic coupler provides communication capability anywhere there is power and a telephone.

A Whisper Writer teleprinter can be used alone as a receive-only terminal, or you can add the intelligent Keyboard for a full-communication capability. Using the intelligent Keyboard, a message can be sent immediately as it is typed, or it can be typed into memory, edited and then transmitted. The unit's electronic memory can store a message of over 4000 characters – up to three typed pages.

Available in a variety of productivity-oriented formats, the 3M Whisper Writer System is a unique, cost-cutting communications tool.

Whisper Writer Teleprinters

- Compact, attractive, lightweight
- Connect directly to phone lines
- Quiet, reliable thermal printing
- Auto-answer with programmed answerback
- One pushbutton simplicity
- Easy to buy, easy to own
- Keyboard unplugs when not in use

Whisper Writer Intelligent Keyboard

- Typewriter style arrangement
- 4000 character electronic message memory
- Full message editing capability
- High quality stepped keyboard with full-stroke keys
- Auto-repeat on all keys
- Easy-to-use, clearly labelled function keys

CONTACT:
LEROY DATA SERVICES PTY LTD, E.D.P. PRODUCTS & SERVICES,
10 DORCAS STREET, SOUTH MELBOURNE 3205. Telephone: (03) 699 1300

computer. When changes are made manually to a large financial spreadsheet, the almost inevitable result is a messy crossing out, a dollop of whitener, or a major retyping task for the typist. With a computer however, a neat new top-copy can be produced simply by setting the printer in operation. SuperCalc incidentally contains a feature to improve the looks of the finished report by laying out headings and so on in a more balanced way. On the Osborne you can also mix the SuperCalc output with the WordStar word processing program to produce a really polished final document. And if that does not impress the bank manager then nothing will.

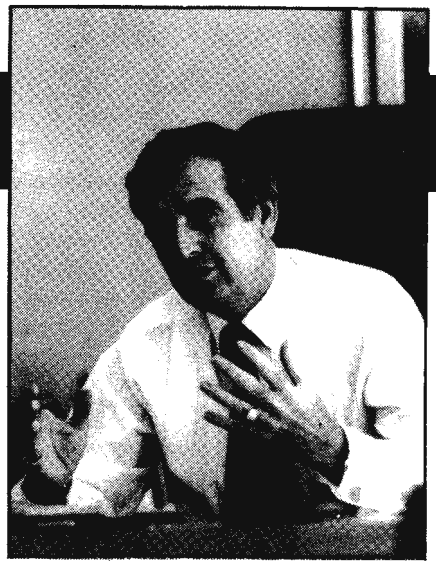
In conclusion my final feelings about SuperCalc and, to be fair, other financial modelling programs of a similar type, are somewhat ambiguous. For businesses where presenting acceptable budgetry and cash flow projections to bank managers or where the need to be able to assess the effect of a few percent change in overheads or profit margins accurately and frequently is an essential part of their operations, I can see that a computer program of this type has a lot of potential and would save a lot of time in the long term.

On the other hand the decided disadvantage is that if a financial modelling program is going to be of any use then a great deal of time and effort must be devoted to defining the parameters and perfecting the logic of the model beforehand.

Many companies may still find it easier to produce their forecasts manually rather than by computer.

This is very much a matter of personal preference. I would just say however that if you think you can just go out and buy SuperCalc and master it within a few hours then you are likely to be in for a big disappointment. Admittedly SuperCalc is fairly straightforward to operate, but mastering the logic behind it is far more complex.

Indeed anyone without some background in accounts work would probably be well advised to enroll in one of the many short training courses on financial modelling which are springing up around the country.



goldsworthy

THE LUCKY COUNTRY?

Ashley Goldsworthy, national president of the Australian Computer Society and chief executive of the S.G.I.O. Building Society in Brisbane, is ABC's regular commentator on business computing. The views expressed in this column are his personal views.

For most of us living in Australia it is still, despite the current economic recession and droughts, the lucky country. We still enjoy a high standard of living, in a country with a stable political and economic system, in a continent which provides a good climate, and generally a free and easy style of living.

Those who travel overseas frequently would certainly perceive Australia as the lucky country as they wing their way back into Brisbane, Sydney or Melbourne, after visiting some of the less fortunate overseas countries.

However, we really must ask ourselves why we are the lucky country, and in fact if we still are the lucky country.

Unfortunately, we have reached the stage we are in at present, not primarily because of the toil and effort Australians have put into building a nation, but primarily because of the wealth that lies in our soil, and the wealth that grows upon it.

For years Australia has "ridden on the sheep's back" and has benefited enormously from exports of primary and secondary products. We were at the same time, able to buttress less efficient indigenous industries with subsidies and tariff protection to retain their competitiveness against overseas imports.

In recent years, however, the situation has changed dramatically. Right at the present time, we see very clearly the enormous impact on the Australian economy of low world prices for minerals, low prices for export beef, low world prices for sugar, and so on. We have reached the stage where the ratio of imports to exports has become a very vital issue.

Only recently the Chairman of Australia's third largest company, C.R.A., referred to the serious nature of this problem. Sir Roderick Carnegie commented that Australia could not afford to continue to borrow overseas at the rate it was borrowing without facing very serious difficulties.

Sir Roderick said that Australia was rapidly approaching its borrowing limit on world money markets. He said there was a desperate need to get back the fundamentals in financial relations with the rest of the world; restoring Australia's competitive position and increasing exports.

It is his comment on the need to increase exports that is particularly relevant in the context of this article.

He went on to say that if Australia was to maintain its standard of living, then we are going to have to borrow at least an average of $7,500 million a year for each of the next three years, or $10 a head for every man, woman and child every week.

He said that all that led him to believe that Australia has got to do a better job of exporting to pay our way.

In referring to Australia's credit rating he said that there is a limit to how much additional debt anyone can go into. He made the point that questions were being asked whether money being invested in Australia would produce export income.

He then went on to say, "That's why I come back and say that export income – which, after all, was of fundamental importance to everybody in Australia from 1850 to 1965 – is so important. We have to be a more effective exporter than we have been in the last fifteen years."

The comments made by Sir Roderick underline the point I am trying to make in this article, namely the importance of export income, allied with the fact that exports of high technology could well be the major export of the future.

At this juncture it is probably relevant for you to ask what has this to do with computers and information technology. It has a lot to do with such technologies, and particularly indigenous technologies.

One of the most significant features of the information technology explosion has been the accompanying explosion in Australia of the imports of such technology.

Unfortunately, Australia has not taken any positive action in establishing indigenous high-technology industries, and consequently faces an ever escalating import bill.

In absolute terms, this bill is very rapidly becoming one of the major items of import into the country. It is amazing to me how little notice seems to be taken of this fact.

One very rarely, if ever, sees any press comment about the amount being spent on high-technology imports. And yet it already is one of the major import items in our total import bill.

In my last article I highlighted some of the very worrying facets of this problem. I also pointed out how badly we fare when compared with other nations of similar size, or even smaller than Australia.

Australia is at the bottom of the scale of so called "developed countries" in terms of our technology exports versus our imports. And the ratio is becoming worse all the time.

In the not too distant future, imports of high technology will become the single biggest import item. A fact, I repeat, which seems to have escaped most people's notice.

Why is our performance so poor? Why haven't we got off our butts to redress the situation?

The answer is very simple – We are the lucky country.

Australians seem to suffer from what has been described as a "technological cringe" when it is suggested that we can compete in high technology areas. There seems to be an all pervading apathy which convinces us that we cannot possibly compete with overseas manufacturers, irrespective of whether that means the United States of America or Finland, the latter with a population one-third of Australia's. We have to shake off the "lucky country" syndrome and realise that luck has nothing to do at all with our future situation. We can no longer rely on natural resources and protected industries to fuel our future economic growth.

There is little doubt that by the end of the decade, the computer industry will be the largest single industry in the world. Similarly, ancillary industries within the information technology field will also grow very rapidly.

This means that in the years to come, information technologies will play a dominant role in the economic situation. It is for these reasons that Australia must recognise the enormous economic disadvantages it will suffer if it continues to import such technologies.

Importing technology means exporting jobs. We must take positive steps immediately to create, develop and support indigenous high-technology

industries.

We have recently seen in Brisbane a sad example of a local firm suffering the consequences of lack of adequate support. A firm which was Australia's largest locally-owned computer manufacturer and a net exporter of computers. A firm which had demonstrated very clearly the expertise and capability to compete, and compete successfully overseas.

There are numerous other examples of efforts that have been made to start local industries, and which have not been able to succeed because of the lack of adequate venture capital. The attitude seems to exist in many sectors of the community, that if it is made overseas, it must be better than if it is made locally.

In 1955 Australia was one of the wealthy countries. In terms of GNP per capita, Australia ranked fourth in the world. Where are we now? Eleventh and falling. Where shall we be next year and the year after?

Unless we start developing our own native, high-technology industries, we shall be even further down the list.

It must be recognised that high-level technology industries play an absolutely central role in this economic scenario.

In 1982/83 imports of computers and related communications and data processing equipment will amount to almost $2,000 million. This is slightly more than the estimated budget deficit for the year. Think of the effect, therefore, if this situation could be turned around so that we were actually a net exporter of such equipment.

The immediate reaction, as I mentioned above, would undoubtedly be that it was a ridiculous suggestion, and an impossible task, but is it?

Australia does have the capacity to compete on the world scene. There have been numerous examples in the past of Australian inventions and innovations which led the world. Why do we feel that we cannot compete?

Australians are rather fond of Irish jokes. Since I visited Dublin some months ago and saw what Ireland had done to attract high-technology industries to that country, I for one have stopped telling Irish jokes.

For example, in 1979 Ireland attracted some $300 million of high technology industries to that country.

The republic of Ireland did that by adopting generous schemes of incentives to attract micro-electronics technology, such as grants of up to 50% of capital cost, 100% of training costs and a 10-year tax holiday for firms establishing in Ireland.

Why did they do this? They did it because they very clearly recognised the future economic importance of high-technology industries.

You might agree that we have the intellectual resources, but feel we do not have the capital resources. Wrong again. We do not need enormous sums of money to support the right initiatives.

Data-General, a very successful world-wide computer manufacturer started with a capital of $50,000. In the Australian case I mentioned above, of Hartley Computers, a capital of $43,000 took the company to sales of $15 million with operations in six countries and a staff of 250. As David Hartley himself said, "An unbelievable performance by American standards".

There are many other related issues that really should be looked at and perhaps in future articles I will address some of these. The role of the Government, industrial relations, taxation implications, capital requirements, and so on all play a central role in this area and there are many changes which need to be made to facilitate development of native industries.

Suffice to say at this stage that what we really lack is adequate national goals. Until we, as a nation, recognise the fundamental importance of computers, micro-electronics, and related technologies to our future we shall continue to rely on luck.

We must also recognise that it is not only an economic impact we are talking about, but also effects in education, employment and a whole host of other areas.

It is still not too late to take a look around at some of our near neighbours and learn from their experiences. We will see nations that have already taken very far-sighted steps down the path towards the Information Age.

We delude ourselves if we think we can continue to ignore the importance of this.

What is likely to happen? Very little, while we kid ourselves that we are "the lucky country".

SALE PRICE
$950 ea
EX STOCK

VISUAL 50

The VISUAL 50 represents a new approach in LOW COST TERMINALS. Although it costs drastically less, it offers features you expect from the high priced units. A distinctive feature of the VISUAL 50 is its emulation capacity. VISUAL 50 is code-for-code compatible with the Hazeltine Espirit, ADDS Viewpoint, Lear Siegler ADM-3A and DEC VT-52. Menu driven set-up modes in non-volatile memory allows easy selection of terminal parameters.

Other Features include:
* Ergonomic Design, Tilt and Swivel Monitor, Detached Low Profile Keyboard, Non-Glare Screen, Matte Finish Keycaps. * Smooth and Jump Scroll * Line Drawing Character Set * Block Mode, Editing * Auxiliary Port Control * 80 x 24 Screen Format * 25th Status Line.

KENELEC (AUST.) PTY. LTD.
(INCORPORATED IN VICTORIA)

48 Henderson Rd, Clayton. Vic. 3168. Telephone (03) 560 1011
NSW (02) 43 2315 Q'LAND (07) 393 0909 SA (08) 223 2420 WA (09) 325 6786.

IT'S TIME. FOR AUSTRALIA

TIME is the new, very fast, on line, professional microcomputer from ECS.

TIME ... for corporations needing desk top computers which communicate with any mainframe network.

TIME can rapidly organise your letters and lists, budgets and bills, facts and figures, plans, schedules, schemes, ... and dreams ... into standard paragraphs, instant accounting, sorted lists, self calculating scientific and financial plans ... and reality. And it exchanges files with the central data base (Unattended!). All in one beautiful machine on your desk.

TIME OFFICE COMPUTERS are perfect for corporate professionals who love to create order in their affairs and need to be on line to their central computer.

You can buy TIME for under $10,000.

TIME.
OFFICE
COMPUTERS

replaces:

- IBM 3275, 3780
- Honeywell 7750, 7700, 7801
- UNIVAC U100, U200
- Burroughs TD830
- NCR 501, 301, 101
- ICL 7181

and excels at:

- Word Processing
- Financial Modelling
- Accounting
- Program Development
- Offline Data Entry
- Remote Job Entry

If your workstations can't do all this, why not buy our TIME and save yours. It's good value . . . and it's Australian.

TO FIND OUT ABOUT TIME.

Intelligent Terminals Pty Ltd

83 Glen Eira Rd., Ripponlea, Vic 3183. Ph: (03) 523 6311

CHECKOUT

The cash flow system

by Alec Glover

"Look after the pennies and the pounds will look after themselves."

Almost an adage from a past age. But today, looking after the pennies has regained new meaning for the small business proprietor. High inflation and high interest rates have made life difficult for every business. For the small business without reserves of cash to draw on, the problem is compounded by late payers on one hand, and the demands of suppliers for prompt payment of accounts on the other.

Money is expensive to borrow, and even more expensive to lend if you don't have it in the first place. Many businesses find that controlling their debtors – collecting on their invoices and statements – is a frustrating and time consuming task. They can't afford to act as a bank for their customers, and they can't afford the time to collect their debts promptly. They are even less able to afford to let their customers' accounts get out of hand.

Generally, small businesses can't afford the expense in terms of time (wages) and effort (productivity) required to plan expenses and income in any detail, or to control their cash flow to any great degree. Even if they do have a detailed budget worked out, the effort involved in formalising their expenditure and income is of dubious value to them. The small businessman knows his position intuitively – he's involved in it every day – he knows what's selling and what isn't because all he needs to do is look at the shelves.

The problem becomes obvious only when the need to explain the financial position to someone else arises. July has a particular unpleasantness about it for small businesses. The accountant needs the right information if he is to prepare the annual return which is in his client's best interests, and his starting point is the business' books. Most small businesses keep the familiar set of Cash Books – one for payments and one for receipts. A set of column dissections provides a scheme for analysing income and expenditure. By the end of the financial year, most small businesses face the job of collecting together all their invoices and cheque butts to bring the books up to date.

Expansion and unexpected expenses place additional demands on the book-keeping system. When an overdraft or loan is envisaged, most banks and other lending institutions require documentary evidence of past performance, and plans for the future. This can be a frustrating and time-consuming task when the loan or overdraft is only required to cover an immediate lack of cash. Banks in particular like to see a cash flow projection which shows how and when they are likely to get their money back.

For a conscientious business, the payments and receipts journals, with their column analysis will provide the historical information needed to illustrate past performance. But what about the future?

The solution to the small businessman's dilemma is at hand! The CASH FLOW SYSTEM. It provides the small business with a simple and efficient method of recording payments and receipts, and the ability to produce cash flow forecasts of the immediate future.

I recently put the system through its paces.

My assessment is based on the assumptions that I am not in possession of any specialised computer knowledge and can write only as an interested business user, and that in making any recommendations I punt for the ideal without regard to the technical possibility of the execution of any suggestion.

Overall I found the system to perform its stated objectives with a minimum of fuss. The presentation and layout are excellent and the incorporation of useful touches such as the display of column names when entering information, and the ability to select the print mode and page size are very kind to the uneducated user.

The menus are clear and easy to understand, and after an hour or so with the system I found it unnecessary to refer to the manual.

The manual is well written and easy to follow. A glossary of terms and repeated explanations of terms such as file, record, etc, is most helpful to first-time users. However one assumption that has been made in writing the manual is that the user understands accounting procedures and functions. The software is obviously aimed at the first time small business user, many of whom have very little understanding of formal accounting procedures. While appreciating that it is not the function or task of the software manufacturer to teach accounting, it may help if a short summary of the principles applicable to the Cash Flow Systems were included. This would help make the system more accessible to a greater potential market.

SETTING THE SYSTEM UP

The system is very easy to get operational. During installation a menu of 24 different terminals and 9 printers offers the user a broad selection of common devices to choose from. I simply selected the TRS-80 Mod II, Diablo printer and CP/M as the operating system (I run CP/M on my TRS-80).

The system comes with a set of demonstration files already set up with some fictitious transactions to help the user find his way round the system. Once some familiarity with the general operation of the system has been gained, the user will want to set up his or her own files.

There is no limit to the number of files that may be set up. For example, several separate cheque accounts may be operated by setting up a pair of Payments and Receipts files for each account.

Setting up the columns for the various functions proved to be somewhat cumbersome. This is because the columns for each of creditors, debtors, payments and receipts is set up independently. It is quite possible to have one set of columns for creditors, and a completely different set of column dissections for payments. Creditors, Debtors and Receipts allow for 26 column dissections. Payments allows for up to three sets of 26 columns (76 in all, since the two additional sets of column names occupy two columns in the original). This involves a fair amount of work to set up, but gives the user a lot of flexibility in the way he analyses his receipts and expenses.

The next stage in setting up the system involved creating files for Creditors, Debtors, Payments and Receipts transactions. This is quite straight forward and involves simply specifying the name of the file, the name of a column names file, a password for file access, and in the case of Payments and Receipts files, an associated Creditors or Debtors file.

Once created, the new set of files is selected by entering the name of the file when prompted by the system.

Thereafter, pressing return whenever the operator is asked for a file name will use the last file name specified.

RECORDING TRANSACTIONS

The Debtors function is used to record invoice entries. Whenever an invoice is entered, the invoice number, date, amount, column, debtor's name, and the due date for payment are stored on disk. The due date is entered as 30, 60 or however many days, and the system calculates the date. Whenever a debtors entry is added to the system, an additional field is created which is not seen during add mode. This is in the balance field. The balance is initially set equal to the amount of the invoice, and as receipts are entered, is updated to reflect the outstanding balance. This is where the power of the system to keep track of cash owed and cash owing comes from. By adding up all the balances within Debtors, a total of the amount outstanding can be produced, along with the due dates for payment.

As our system suffers from power spikes, it is useful that the information is written to disk on a per entry basis rather than in a batch mode.

The Receipts function – as the name implies – provides facilities for recording cash receipts. The format is simple and adequate for the small business. Date, Debtor, amount, column, and invoice number are entered for each receipt. If a matching invoice is found in Debtors, its balance is reduced by the amount of the receipt. And it all happens in the blink of an eye. The only indication to the user that the update has occurred is an asterisk appearing after the amount.

Recording Creditors and Payments transactions is much the same as for Debtors and Receipts. As anticipated expenses are added to Creditors a balance field is created, and later updated by Payments entries. The Creditors function expects an order number to be assigned to each transaction. In most businesses these days order forms are not generally used and a lot of expenditure cannot be related to a specific order form (eg. rent, lease repayments). In these cases the order number must be regarded as simply a transaction number which identifies the entry for later update when a payment is made.

SEARCH AND REPORTS

As indicated in the manual, the Search function is a most powerful management tool. I agree with this conclusion. The only comment I would make is that there is a temptation to produce lots of reports to compare various categories of income and expenditure. After a while, however, the operator is left with a pile of papers with figures on them and it is necessary to try and remember what each report set out to show. A line at the top of each report showing which atrributes have been searched and listed would simply solve the problem.

Reports of any type (except Column Totals which is a separate function) are produced by specifying a set of search attributes. These attributes are selected by the operator and can represent anv combination of factors. For example, a report of all Creditors who have a balance outstanding, or all Debtors in a particular column dissection in a particular month. The possibilities are almost endless.

All reports are produced on the screen by default. If a hardcopy printout is required the printer toggle is turned on, and the report will be sent to the printer as well. Simple but excellent.

FORECASTS

The Forecast function takes the anticipated expenses and receipts, and the due dates for payment, and produces a listing or graph of the result. The graph provides an instant 'snapshot' of how the bank balance is likely to fluctuate over the period in question. Because graphics capabilities are not standard from one computer to the next, the Cash Flow System uses a simple system of plotting with '+' signs to form the graph. This has obvious aesthetic limitations, but does mean that the system is able to be used on any CP/M machine with an 80 character by 24 line screen.

SPEED

A sophisticated system of linking and indexing records has been used to provide almost instant response to the user. The system knows how many and what type of records are stored, and instantly informs the user if no entries of the type specified are available.

IN SUMMARY

The ability of the Cash Flow System to produce a complete set of Payments and Receipts books, ready to take to your accountant, is something of which small business could make good use. But the real power of the system lies in being able to plot the likely bank balance into the future, anticipating future peaks and slumps.

Software Solutions have put a lot of time and effort into making the system easy to learn and use. It is fast and virtually impossible to accidentally make a serious error.

Additional facilities for the program are under development and should appear within the next few months. Amongst these will be the facility to print the graph produced by the forecast, and listing of creditors and debtors in due date order.

Software Solutions, 11 Ormond Road, Elwood, Victoria, phone: (03) 531 4607.

BUSINESS OWNERS
FIGHT THE RECESSION
BARTER, DON'T USE CASH

JOIN THE BARTER NETWORK

The BARTER NETWORK is a computerised cashless credit card where members can pay in their own products and/or services.

BUY GOODS – SERVICES AT YOUR OWN WHOLESALE COST

allows you to buy everything at your own wholesale cost of goods.

BRINGS IN NEW BUSINESS

other members will travel across town to buy from you because you are also a member.

GIVES YOU A NEW SOURCE OF WORKING CAPITAL

As you can exchange your goods and services for your needs it allows you to retain your working capital to operate and expand your business in other areas.

Call or Write to

BARTER NETWORK OF THE PACIFIC PTY LTD

338 Queen Street, Melbourne.
Telephone: (03) 329 7998.

Continued from page 8

claiming procedures, the system enables contributors to have all their transactions processed by the same teller in a branch and also provides them with a detailed transaction assessment slip that lists how much has been paid out, to whom (the contributor, a doctor or a hospital) and for what services. This is extremely useful for personal records and for taxation refund purposes.

From the organisation's viewpoint, the computer system's capacity to rapidly update contributor files is very important. Previously, a complex procedure involving the collation and checking of data and its recording on microfilm in Melbourne, followed by key-punch operations, meant a two to three week delay in updating files. With the OLHIS system, all files are updated overnight.

HBA's assistant general manager (Operations), Kevin Rusbridge, says that the overnight file update enables management to respond to changes rapidly, confident that the decisions are based on accurate information.

"The capacity to react quickly to a variety of situations is becoming essential for service and effective operation in the health insurance industry. Decisions about matters such as appropriate insurance rates, movement of finances and diversification of activities require a much greater degree of accuracy and control in the 1980s than ever before."

OLHIS was introduced gradually over an 18 month period and became fully operational in mid-1982, two weeks ahead of schedule. This was despite a major flu epidemic which hit staff and increased the claims workload, and coincidental changes in hospital charges and insurance rates together with alterations to critical item numbers for medical and hospital services.

The efficiencies brought about by OLHIS are indicated by the fact that HBA employees are able to spend more time attending to customers' needs now than two years ago, with no increase in staffing levels.

With an influx of 15,000 new contributors in the first two months of this financial year, HBA is taking advantage of change, greater control over finances, improved efficiency and increased flexibility.

BEATING PRINT-OUT PRESSURE POINTS

Because of developments in silicon-chip technology and micro circuitry, modern production methods have not only lowered costs but increased performance so that the small business computer delivers more per purchase dollar than just a few years ago.

With this ever increasing demand for micro computers, there is an increased need for the efficient processing of the vast quantities of continuous forms output such as company invoices, statements, stock printouts, sales records and associated business statistics which are produced by small business computers.

Realising this need, G.B.C. (Australia) Pty Ltd have released two Forms Handling machines ideally suited to satisfy this growing market.

The G.B.C. Burster 120 will separate continuous forms into individual parts by feeding the forms into the machine which are first picked up by a slow moving roller and then grabbed by a fast moving one. This action neatly separates the continuous forms at the cross perforation which is pulled against a "breaker blade".

The portable desk top G.B.C. Burster 120 is manufactured of high grade moulded plastic over a steel frame and is an easy machine to load, having the ability to detach 1, 2 or 3 part continuous forms at the touch of a button.

The G.B.C. Decollater 60 uses a waterfall technique to separate multiple part continuous forms into separate sets which cascade down the side of the machine and neatly refold themselves into individual stacks.

Manufactured of plated steel tubing and impact resistant plastic the Decollator 60 is compact enough to fit on any desk top and will decollate small packs of two to four part continuous forms, handling both carbonless paper and carbon interleaved forms equally well.

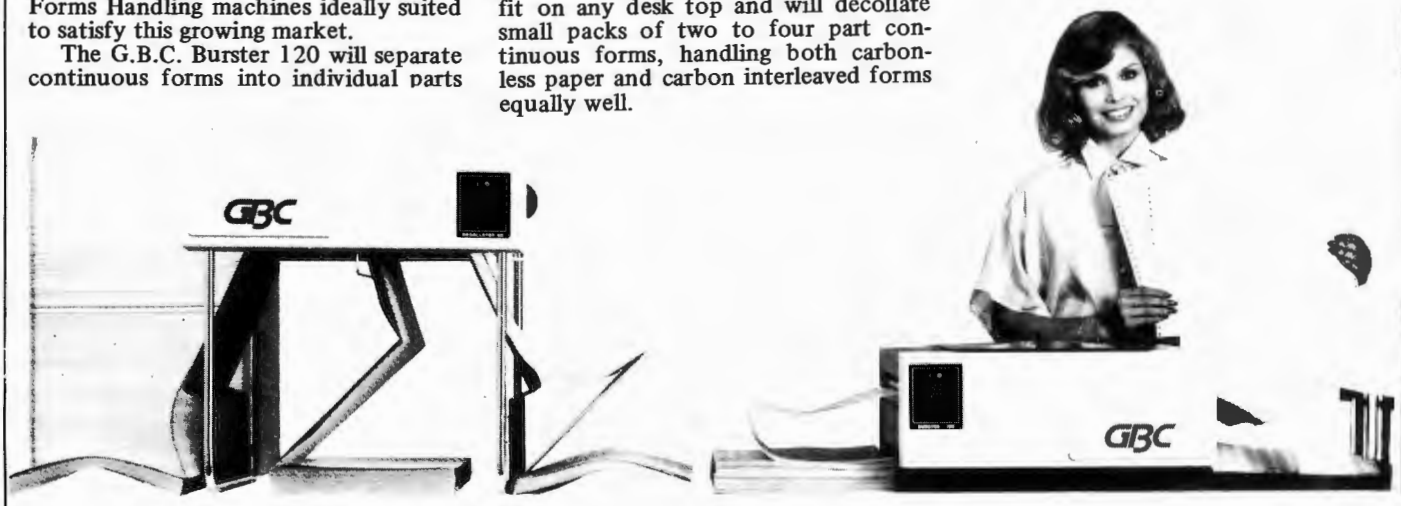
Both of these new G.B.C. forms handling machines are competitively priced, easy to operate and will create an air of quiet efficiency in any busy office or data processing installation that is manually handling their continuous forms output. These new machines are available from G.B.C.'s nationwide network of branches and agencies

DISTRIBUTED MULTIPROCESSING

Sysnet 2000 is designed around the concepts of a distributed multiprocessing unit with two additional objectives: it meets IEEE S-100 standard, and is completely CP/M Version 2.2 compatible. Each user in the Sysnet 2000 gets a dedicated Z80A microprocessor, 64k or 128k memory bank and local terminal I/O. In addition to each user's individual processor and memory, a fully interrupt driven Z80A based central service processor and up to 512k main memory are added to support the entire network and manage all of the common system resources such as disks, printers, communications, and batch processors. The advantage of this design is clearly demonstrated in comparative benchmark tests against single processor multiuser systems. In its present form each Sysnet 2000 DMU will support up to 16 users. To produce an even larger configuration, multiple systems can be interconnected via a high speed communications channel to produce a major network of high performance microcomputers with outstanding response and throughput.

BARTER

A Melbourne company, Barter Network of the Pacific Pty Ltd, announced a new



Making light work of forms separation with the GBC Automated Continuous Forms Separator.

service whereby members of the group trade off goods and services with one another.

The benefits are: (1) the retention of capital (allowing dollars to be used elsewhere); (2) it brings in new business – members buy from members; and (3) goods can be bought at your own wholesale cost.

Barter Network can be contacted on (03) 329 7998.

THE "DOUBLE-BUNGER" EFFECT – INSURANCE COVER Vs MAINTENANCE CONTRACTS

Australia is now entering the age of computer insurance. Computer Insurance is a common phenomenon overseas and yet it is an area in which Australia has been sadly lagging behind.

Computer users are generally unaware of computer insurance. They believe their only form of protection against breakdown is the manufacturers hardware maintenance contract – if available. These Contracts cost upwards of 10% per year of the hardware value and give cover only against breakdown. Elmtech of Crows Nest (in conjunction with one of Australia's largest Insurance Underwriters) now offer comprehensive insurance packages for both personal and commercial users. These packages, for a fraction of the cost of a maintenance contract, cover the user against such events as:

PERSONAL PACKAGE
1. Electrical or Mechanical breakdown.
2. Damage or loss of Purchased Packages.
3. Damage sustained whilst in transit.

COMMERCIAL PACKAGE
1. Electrical or Mechanical breakdown.
2. Damage from Accident, Malice, Fire, Theft, Flood etc.
3. Data media including costs of restoration.
4. Increased costs in working due to a computer breakdown.

Elmtech comprises a group of computer specialists who work in conjunction with the insurance industry.

"What we found when we began marketing the Personal Insurance, was that we were getting an enormous number of enquiries from commercial users" said Mr B Corr, sales manager for Elmtech. "So we and our underwriters sat down again and designed a policy to meet all the requirements of a commercial computer user. The Commercial Insurance Package we now offer is, we understand, the only policy available which does not require the user to be already covered by a manufacturers hardware maintenance agreement, by achieving this, we have saved the user the "DOUBLE-BUNGER" effect of having to pay twice for the same service."

should welcome the idea as more people than before will be in the market place to buy computers because the overall cost of ownership can now be less. Anybody wishing to know more about computer insurance should ring Elmtech on (02) 92 4175.

A STEP BEYOND THE STATE-OF-THE-ART 4 YEAR WARRANTY

Intelligent Terminals Pty Ltd has taken the state-of-the-art in business applications packages a step further with the release of Davidson Software, a sophisticated suite of bookkeeping/accounting packages loaded with features.

Designed around an advanced file management technique that gives increased data storage and faster response times, Davidson Software packages do more than merely automate bookkeeping, they provide a powerful business tool that gives up-to-the-minute cash-flow details, prompt billing and payment, audit standard accounting and the capability for meaningful management reporting.

The Davidson Software suite consists of an Integrated Invoice Package, General Ledger, Cash Payments Package, Cash Receipts Package, Creditors Package, a Debtors Package and a Stock Details Package for use with invoicing. Each has unique features that make them an asset to any business.

Aimed at first-time micro users as well as larger businesses with distributed data processing environments, Davidson Software business applications packages are menu driven for easy use by non-dp personnel, and can be used in stand-alone or integrated modes depending on business needs.

A feature of special interest to companies with links overseas is Davidson Software's ability to select program terminology for Australian, American, European, Asian or Japanese accounting systems without the need to use different versions of the program to support each country.

Intelligent Terminals Pty Ltd believes that not only does Davidson Software represent the state-of-the-art in business applications packages, it also brings an unparalleled level of reliability to the field. To back up this belief Intelligent Terminals Pty Ltd are offering a state-of-the-art guarantee for Davidson Software – an unbeatable 4 year warranty.

Davidson Software is available from better dealers throughout Australia, or direct from Intelligent Terminals Pty Ltd at Suite 6, 83 Glen Eira Road, Ripponlea, Victoria 3183, telephone (03) 523 6311.

EXCITING NEW BUSINESS OPPORTUNITY

A BUSINESS THAT BENEFITS FROM A RECESSION

Would you like to offer businessmen and professionals a new source of working capital, the opportunity to buy many of their needs at their own wholesale cost and to greatly increase their sales?

Through the BARTER NETWORK credit card system you can do this. This system is a method whereby businessmen and professionals can pay their bills in their own goods and services.

The BARTER NETWORK OF THE PACIFIC is looking for businessmen to run our affiliate offices and to market our computerised barter network charge card service in their area. We handle all the accounting, paper work, national advertising, etc. You deal with the clients in your area.

Capital requirement is $15,000 plus office facilities.

Excellent profit potential for the right individual.

For further information call the Managing Director

BARTER NETWORK OF THE PACIFIC PTY LTD,

338 Queen Street, Melbourne.
Telephone: (03) 329 7998.

MR BUSINESSMAN - THE FUTURE IS HERE NOW, AND YOU CAN BECOME A PART OF IT

THE AUSTRALIAN BEGINNING MICRO-COMPUTER NETWORK OFFERS THE EXPLOSIVE GROWTH POTENTIAL YOU HAVE BEEN WAITING FOR.

Australian Beginning is now offering the opportunity to do more than just become a part of the micro-computer industry (probably the fastest growing industry in Australia).

Australian Beginning now offers you the opportunity to become involved with micro-computer networking, which is considered by many to be the wave of the future in this industry.

The Australian Beginning is looking for an individual or groups of individuals in any of the following areas, W.A., S.A., QLD., N.T., TAS., ACT., to work and develop the market for our revolutionary service in their respective areas.

The Australian Beginning is a computer network service which offers a wide range of services to its members.

Australian Beginning members can now have access to the computer services, data banks and large storage space previously only available to large computer installations. The era of the personal computer is now here, as now through The Australian Beginning any businessman or individual can now have on his desk for an extremely small cost, a system that has the level of storage power, computer services and data banks for which only a few years ago government departments and large private companies were paying millions of dollars.

Australian Beginning can be accessed by virtually any micro-computer, word processor, or terminal over standard telephone lines. The services The Australian Beginning offers are:

1) Information Services - members have access to a number of information services which include news, sports, weather, stock-exchange prices, commodities and many others.
2) Electronic Mail - members are able to communicate nationwide with other members through our systems.
3) Software Bank - members have access to a myriad of computer programs that will include entertainment, education aids, programming and diagnostic tools, and financial applications
4) Large Computer Power - members have the capability to make use of the large computers' huge storage capacity by using any of our large programs on our system.
5) Electronic Shopping - members can take advantage of our shopping by computer system to get the best prices of a number of popular business and consumer items.
6) Telex - another interesting feature is that members can send telex messages through our system to any telex user and at the same time receive messages from other telex users.

The Australian Beginning service is both inexpensive and extremely easy to use. It represents what the microcomputer revolution is all about; now that it is making computers both affordable and understandable.

The Australian Beginning group has a very interesting distributorship proposal for local businessmen who would like to get in on the ground floor of the fastest growing industry in Australia. If you would like to team up with a group that many people feel represents one of the most aggressive and inventive marketing groups in Australia

Call the Managing Director now before your area is taken.

THE AUSTRALIAN BEGINNING PTY LTD
364 La Trobe Street, Melbourne, Victoria, 3000
Telephone: (03) 329 7533

Grasp the concept

AND BRING THE WORLD OF COMPUTING TO YOUR FINGERTIPS

Subscribe now

I would like to subscribe to Australian Business Computer for 1 year (10 issues).

☐ $29.50 within Australia ☐ Aust $40 overseas surface mail ☐ Aust $100 overseas air mail

☐ I enclose my cheque/money order, made payable to Australian Business Computer for $

☐ Please charge my Bankcard. Bankcard Number . . . . . .

Expiry Date . . . . . .Signature . . . . . .

Name . . . . . .

Address . . . . . .

. . . . . .Postcode. . . . . .

Please send this form with your remittance to Australian Business Computer, Subscriptions Department, P.O. Box 280, Hawthorn, Australia 3122.

Scuttling the pirates –is it worth the cost?

The reasons for 'illicit' copying of software are as many as the types of people who take the copies and some 'pirates' are always one step ahead. Marcia MacLeod explores the choppy waters of program protection.

That "piracy", "license abuse" or "copying" of software exists cannot be denied. But the very words used to describe the deed indicate the difference in attitudes of suppliers, distributors and dealers toward illegal copies, and towards software protection.

'Business pirates exist because the software industry hasn't got its distribution system developed satisfactorily yet'.

Estimates of how many pirated programs are in use range from "very little and mainly in the games market" to 30 or 40 per cent of existing software. One American company believes that for every one program it sells, another four – 80 per cent of its output – are in use illegally. However, some of the people who use illegal copies would not have purchased the software in any case. Scottie Bambury, chairman and managing director of DJ'AI Systems which produces 'The Last One', believes that only 10 per cent of pirate copies in circulation are actually 'lost' sales.

Whether or not most piracy centres around the games/hobbies trade is a major source of controversy. Peter Hewitt, marketing manager of Microfocus, feels business piracy levels are low. "We believe we're not losing substantial revenue through piracy. Businessmen are not particularly interested in using software illegally."

But other suppliers know better. John Hale, managing director of Peachtree Software International, admits that it is a temptation even for his own staff to take copies of 'colleagues' disks – not, he adds, that the temptation is even succumbed to.

John Baldachin, managing director of Little Genius and designer of its Protection program, believes that business piracy is rife if for no other reason than that employees of large companies send their software around to other departments and other branches so that they, too, may benefit from a useful program.

AMATEUR OR PROFESSIONAL

The difference in business and games piracy stems, perhaps, from the two breeds of software pirate: professional and casual. The professional pirate is the one who copies software for financial gain. He may simply sell the disks as cheap copies or, if he's very ambitious, distribute them under his own label. The casual pirate makes copies of software for friends and workmates, either as a favour or to

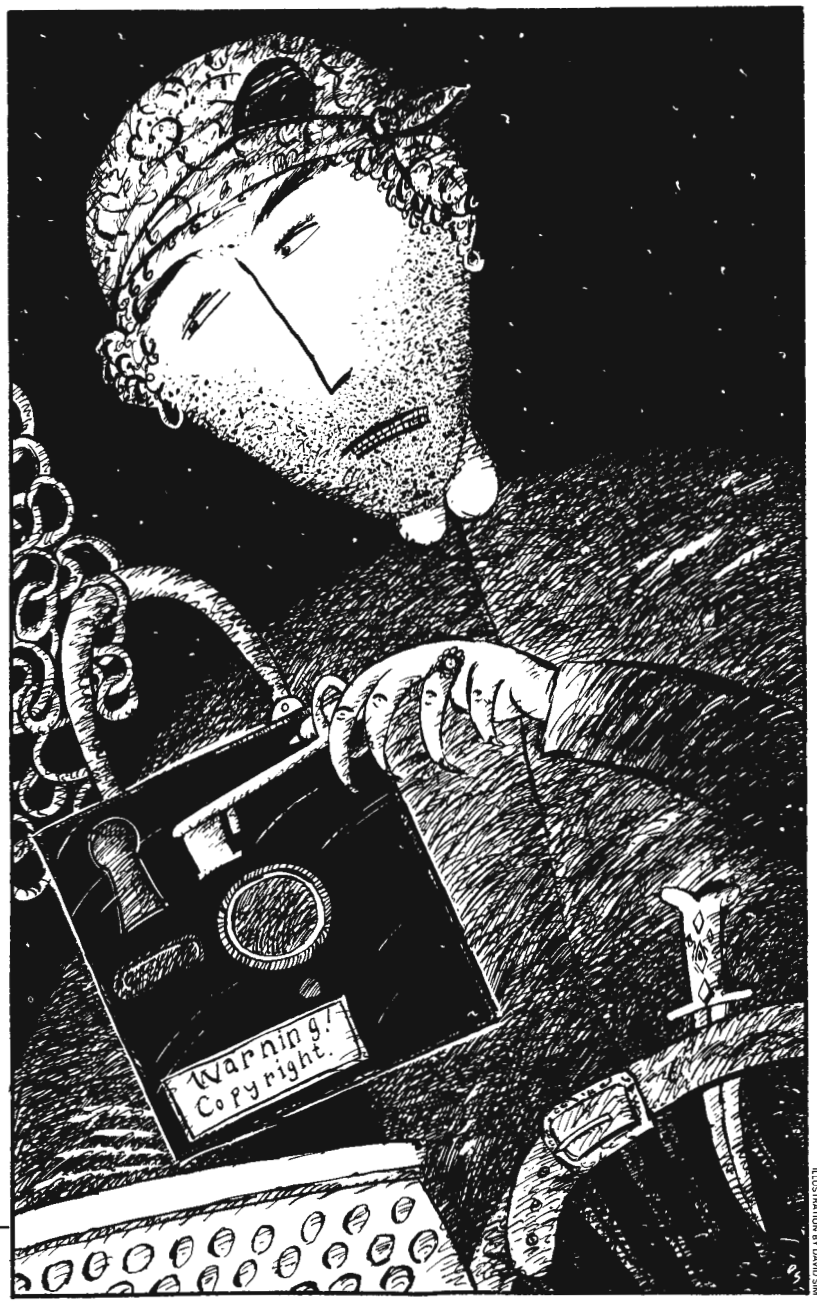
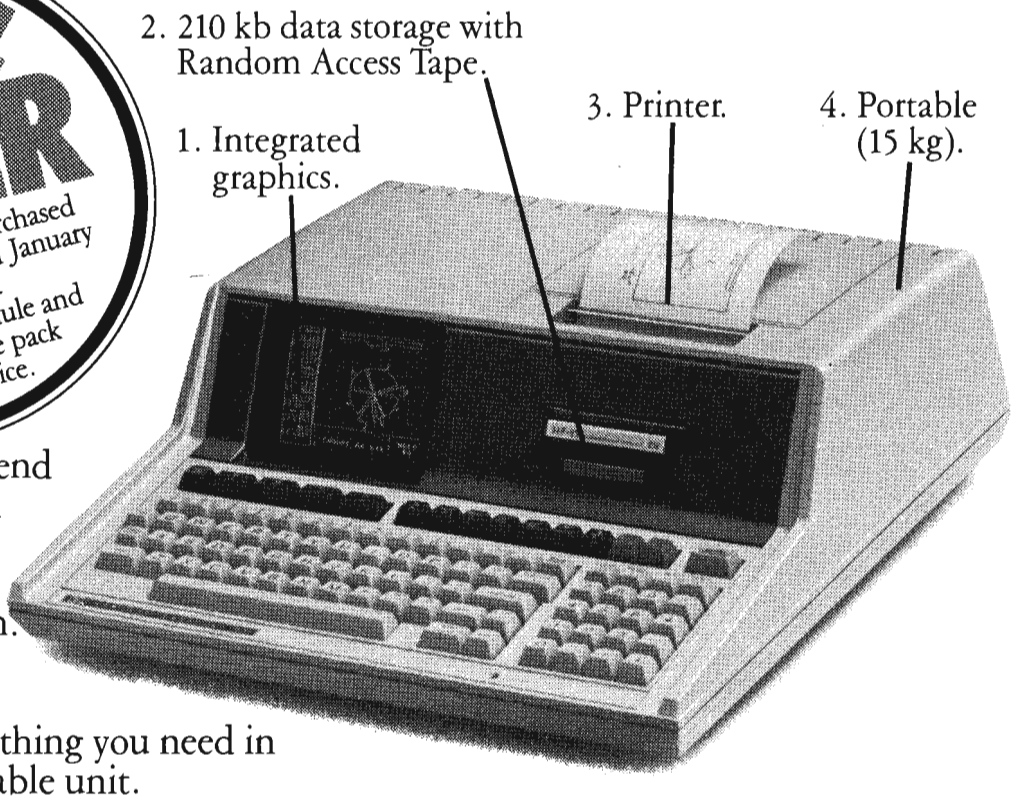


ILLUSTRATION BY DAVID SIM

Hewlett-Packard put it all together.

SPECIAL OFFER

With each HP-85 purchased during December and January receive free a 16K memory module and HP-85 Software pack of your choice.



You can spend a lot of time and money building up your own computer system.

Or you can buy the HP 85.

It has everything you need in a compact, portable unit.

Just plug it in and start programming in easy BASIC language.

You can analyse your data with the HP 85's integrated graphics.

At the touch of a key, it gives you hard copies via the built-in printer.

And in case you forget, the HP 85 offers 210 kilobytes of Random Access Tape Memory.

Other features include powerful, time saving HP Software for both business and scientific applications.

There's also a degree of friendliness in the HP 85, unrivalled in a computer of its size. Like helpful error messages and automatic syntax checking.

Of course you may eventually wish to expand your HP 85 system. An HP interface lets you plug in up to 14 peripherals without disassembly.

To locate your nearest Hewlett-Packard dealer, call Hewlett-Packard. Sydney: 887 1611; Melbourne 890 6351; Adelaide: 272 5911; Perth: 383 2188; Brisbane: 369 8022; Canberra: 80 4244.

HEWLETT PACKARD

HP91

recoup some of the money spent on the original package.

> 'It's lunacy to put protection on a program so the users can't take a back-up copy'.

Some software companies are convinced that business piracy continues because of the convenience of taking a copy of an immediately available disk. "I believe business pirates do it not to save money but because the software industry hasn't got its distribution system developed satisfactorily yet", claims Hale. "Anyone who is going to use a business system wouldn't mind paying another $400 if he could get the software quickly enough."

Hale is one of many suppliers who believe that if software presentation is attractive and follow-up support (including training and updates) is good, few casual pirates would exist. "The biggest defence is the product itself", he says.

"As long as we make the product accessible and good enough people would rather have quality documentation with a proper manual instead of a tattered photocopied one. A quality product and good training, service and support, will mean users will want to buy legitimate software and not illicit copies."

Brian Androlia, a director of ACT (Holdings), a parent company of ACT (Microsoft) predicts am even greater need for professional support. "As software gets more and more sophisticated, the user becomes less likely to go to a pirate as he will want support. He needs training. People do not want throwaway stuff any more. They won't risk having no support or a poor copy if it might lead to expensive mistakes."

HARD PRICES FOR SOFTWARE

Lower software prices will also eliminate piracy say some experts. As John Baldachin points out, the temptation to buy a poor pirate copy quickly fades in the face of a $20 cassette, but regains strength if the software costs more than $40.

Dark Star, a new company responsible for the bit copier Snapshot, believes that "reasonable" software prices would eliminate the need for products such as Snapshot. "Software costs are ridiculously high. Until recently margins were so high that products such as ours are inevitable," said a Dark Star spokesman.

But a low retail price isn't always the answer. Dark Star itself claims that Snapshot in turn has been copied bit for bit (although, it says, it "welcomes the competition") despite its $200 price, and Visicalc, which sells at around $250 is one of the most copied programs on the market, despite its "protection".

Other people, such as David Imberg, a director of the Software Rental Bank, point to the games market when they claim that people will pirate regardless of software cost.

Stephen Holmes, Apple II product manager, is one micro man who forecasts that software prices will come down. "I think in the next four to five years we'll see software get cheaper and cheaper. As developers realise there is a mass market, they will realise that they will sell more at a lower cost and make more money – as well as stamping out some piracy," said Holmes.

For Terry Poole, managing director of TABS Ltd, the high cost of software is not only justified but likely to increase over the next two or three years "until all of the software bugs are ironed out. TABS spent $35,000 on documentation alone this year. Gross margins are not so high when you take into consideration the staff, marketing and documentation costs of developing a package," Poole claims.

PROTECTION MONEY

If a software supplier spends six years and up to $50,000 on developing one program the company will naturally wish to prevent piracy as it has to recover its costs. If providing an attractively presented package with good support does not convince all users that they must have their own authorised program, other steps must be taken.

While some companies claim they do not protect software, they are rarely forthcoming on their reasons. Computech, for instance, was "much too busy" to talk to us. Is all available spare time spent hunting pirates lured by unprotected treasure?

Despite accusations levelled at suppliers that they spend more on protecting software than they would lose through piracy of unprotected packages, most companies believe that they are saving substantial sums in potential piracy for a small outlay on protection. Stephen Holmes quotes $650 to $900 plus "a little labour" to protect one Apple package. A hardware dependent protection device, such as a dongle, runs around $75. These are small sums compared with the thousands of dollars that one pirated copy might cost the software house.

According to John Baldachin, some software houses are sitting on developed packages for fear of piracy. His company held up its new Scrabble program for a year to ensure it had adequate protection before going on the market.

The software house which decides to protect its products from piracy has a choice of three methods of protection. These are registration and licensing, a protection program, and a hardware-dependent device. Any of these protection methods will deter most casual pirates in the same way that an alarm will deter the casual car thief. John Hale even thought of attaching a false deterrent label to Peachtree's programs which read: "This software product is protected by a time lock and any copies in excess of one will be self corrupting after an indeterminate period." Only the thought of discovery by the industry stopped Hale implementing this ruse.

Licensing is the easiest of the three piracy prevention methods. Some people say it is the most effective. Peachtree "makes a big fuss about its licensing agreement so that no one is in any doubt they are in breach of licence if they copy a software package." The company was also one of the first to prohibit the sale of a manual without its relevant disk or cassette when it realised that, without a manual, less pirated copies would be sold."

Microfocus uses the licence system to avoid the problem of large companies making several copies for use in different departments. Any licensed user may purchase an "additional use" licence to allow use of the software on more than one machine. Peachtree also produces a "multiple user" licence.

A UNIVERSAL PADLOCK?

"Intelligence" claims that it has developed the first universal answer to software piracy in the microcomputer industry with a new software protection device.

Ashley Ward, managing director of Intelligence, said: "More than 80% of the software in use on microcomputers is pirated – not by the professional but by the casual copier – which is costing the industry millions in lost revenue. We realised that if we were to suffer from this problem we simply could not survive.

> Some software houses are sitting on developed packages for fear of piracy.

"Originally, on the Apple computer we used a simple security device in the games part. Now we have developed a piece of hardware which is cheap to produce but uses highly sophisticated circuitry. The unusual feature of this device is that it can protect any program on any machine."

Ward said Intelligence expects to be producing over 1,000,000 units during the coming year. One American software house he claims took a small trial batch of units and has now adopted SPD as a standard part of all its hardware packages.

Ward added that over 2 years of research had gone into the protection technology. "As long as the present copyright laws and attitudes of end users continue, a method such as SPD will be the only means of helping the industry protect its investment in new software."

FOILING THE EXPERTS

Some companies will not provide any support (including answers to telephone queries) unless the software user can quote a registration or serial number which matches the supplier's master.

Other software houses offer incentives for honesty. Micropro in the US advertises on each of its Wordstar manuals a reward of $100 for every piece of software not bearing the Micropro label returned to the company – and replacement with an authorised Micropro copy free of charge.

For those software houses which feel licensing is not sufficient, there are protection programs, (such as Little Genius' Protection), and hardware-protection systems. But any of these devices can be broken with expertise, patience and time. Some computer buffs may even break them for the fun of it. But there is a big difference between breaking a protection mechanism and pirating software.

The marketing of back-up programs, such as Snapshot or Apple Orchard's Copy Plus II, designed to break protection systems, do not really have any bearing on the pirate trade. The true pirate does not need a Locksmith to reach the protected program, and he wouldn't waste his money buying one.

Designers of copying programs claim that their product is essential to the software user who requires a back-up copy of his protected software. The very act of protecting programs to prevent copies being made places unacceptable restrictions on the software user. The supplier may be protecting his software, but is he also alienating potential customers?

"It's lunacy to put protection on a program so the users can't take a back-up copy," insists Martin Blaney, managing director of a distributing and importing company. "The idea of having one copy is crazy – what happens if you pour coffee over it?"

Certainly a software user isn't going to be too happy if it takes five or six weeks – as too often happens – for a replacement disk to arrive. But there are several solutions to this valid problem. Companies can supply two disks or cassettes for the price of one or provide the second program at a nominal charge – although this extra copy accounts for around five per cent of the total product cost.

SUPPLIER BACK-UPS

John Baldachin places the onus on the user to insure software and protect it from damage. "If you spill coffee all over your electric typewriter and short it you don't expect to be given a second one free." Other software suppliers are more sympathetic. Tony Riley, managing director of Apple Orchard explains: "The user is not buying a physical disk, he's buying the right to use the expertise which went into the development of the software. I'm not entirely sure companies have the right to charge even a nominal fee for a second disk."

For Baldachin, the answer is to offer modifications to Protection which allow the supplier to make back-up copies for his customer. For other companies, such as Peachtree, the serialisation system allows each purchaser to make as many back-ups as he likes for use on the one machine only. The theory is that if the user can have at least one back-up copy at little extra cost, another temptation for piracy will be eliminated.

Some suppliers insist that, if their software is to be protected, legal processes must be employed to back up that protection. Legal costs are high, but the wounded software supplier will recoup more than a legal financial outlay by halting future piracy.

Peachtree has successfully sued two pirates. Both cases are being settled out of court. Little Genius has gone further by patenting its Protection package. "You cannot prosecute a man for selling a copying program. But if you patent your software you can prosecute someone for reproducing the software in the copying system," added Baldachin.

Are software suppliers becoming too paranoid about pirates? Ted Clough, secretary general of the Institute of Data Processing Management, thinks so. "Vendors who are making too much fuss about copying may be doing themselves a disservice. If they took a more realistic attitude people might co-operate more," he says.

But, he agrees, the program developer has to recover his costs. And if one package retailing at a couple of hundred dollars is purchased instead of pirated, then the money and effort spent on protection is justified.

END

What's the Big Deal about self cleaning disks

- Fits all current Mini-Disk drives
- Special BASF magnetic coating
- Permament self-cleaning
- Resistance and durability
- Formatted for immediate use
- Individually tested

5¼" DISKETTES

$2·99 EACH minimum quantity 50

3.50 each minimum quantity 10

Prices do not include Sales tax

Please send to:
CONTINUITY MEDIA SUPPLIES
Australian suppliers of BASF
184A Barklay Street,
Footscray, 3011
Phone: (03) 687 6790

BASF

Quantity	Price ex. sales tax	Price inc. sales tax
☐ 50	$149.50	$179.40
☐ 10	35.00	42.00

Plus postage and handling

☐ Please send me further information of the complete BASF product range

Name.....

Address.....

.....Postcode.....

☐ Cheque ☐ Money Order ☐ Bankcard

Bankcard Number.....

Expiry Date.....Signature.....

BENCHTEST SOFTWARE

PERSONAL PEARL

by Kathy Lang

Pearl is described by its authors as enabling the user 'to create a library of the highest quality programs designed by you, for your Personal Pearl leads you through the program design'. In use, however, it is very similar to a number of other information management packages. Pearl begins by asking the user to define a record format, including screen layout and indexed fields, goes on to provide facilities for data entry, and then gives options to design report formats for getting information from the database. These functions are made available either through a 'service directory menu', which is shown in Figure 1, or by the user typing the program name for the particular function.

Pearl is closer to being a true database system than many I've seen, as it builds a data dictionary for indexing which is designed to permit extraction of information from one file by reference to fields in another. So, although Pearl is billed as a program generator, from a user's point of view it's much more like a data management system — you would, for instance, have a hard time trying to write production control programs with it. This is especially true as Pearl doesn't allow you to display or modify directly the programs you've 'written', only execute them and therefore it seems of little importance to the user whether particular applications are provided by parameter-driven programs or parameter-written programs. However, bearing those comments in mind, Pearl does compete quite well with some of the other data management packages around.

Constraints

Pearl files can be as big as the CP/M limit of 8 Mb. Maximum record size is determined by layout: up to three screens' worth is permitted provided you don't exceed 250 fields. Screen displays are limited to 17 lines if you want to preserve the facility for providing HELP information on the bottom of the screen. Fields may not occupy more than one screen line, though if the screen width permits you can go up to 127 characters. Numerical accuracy is to 15 digits. Three types of field are provided: numbers, characters and dates.

One or more fields may be designated as key fields, which may be unique or may contain repeated values. Once the format of the record has been decided, changes may still be made even after the file contains data records, but only changes to and additions of non-key fields are allowed. During form design a maximum length for each field is given, but data is actually stored in packed form — so that, for instance, a field which has no value occupies no space.

Input and validation

The data input process consists of four stages. The first involves designing the layout the record is to have on the screen. This layout will be used for displaying each record when the data is input, edited or deleted. (At present only one format per data file is possible; in later releases Pearl is likely to permit several formats 'overlaying' the records in a file.) The layout process involves giving each field a label or caption and showing (for instance by using underline characters) where data will be placed for the field. The placing is at this stage purely visual, and has no implications for record formats: this comes in the next stage, which involves defining data areas.

Straightforward facilities for the novice user

Data areas are defined by placing the cursor at the start of an area; Pearl then assumes that the field extends up to the next space (on the same line — fields may not spill over two lines). For each data area you must define an abbreviated name of not more than seven letters, which is the name by which the field will be known for Pearl operations; the label is purely to help the operator, and the two could be quite different if you really wanted to do things the hard way. You then indicate the type of field, whether its presence is mandatory or not, and whether it is to be calculated from other field(s) in the same record. Index or key fields are not indicated at this stage; that is done in stage three.

To allow the user to define key fields, Pearl displays the record format just set up and asks to be told which fields are key fields, and whether each is to contain a unique key or whether more than one record may have the same value. It is not essential to define key fields; if you don't, Pearl will assume that the first field is the only key, and direct access to individual records will be possible only with that key. The fourth and final step is to establish any links there may be between this file and others set up by Pearl; it is possible to have fields copied from another file, calculated from data in another file, or just brought into the record layout for display purposes.

Once you have designed a format you can use it to enter data. The same section of Pearl is used to enter new data and to edit existing records. Data validation is quite thorough. Dates are checked for plausibility, number fields may only contain numbers, and you aren't allowed to save a record if any of the 'mandatory' fields do not have data in them. (Unfortunately Pearl only tells you about one at a time, so if you miss two you have to go round the save/re-edit cycle twice, but it's very quick.) If you enter a value in a supposedly unique key field which is already present in the file, that error too is flagged.

When retrieving existing records for editing or display, you just put the cursor on the particular key field(s) you want to match and type in the required value. Matching is by identity only while editing, although partial matches are permitted to some extent — for instance, if you are searching a key field containing names, typing 'Hill' will result in Pearl finding a record with 'Hill' in that field if there is one, if not it will find the nearest — 'Hills' for instance. You can scroll through the file by asking for the 'next record', so if there are several people called Hill you will get each one in turn, followed by Hills, etc, if they exist, and then the less closely related values such as Smith. When a record is displayed, you can get a copy of it on the printer.

Displaying data

Individual records retrieved by key can be displayed or printed as I've already described. This mechanism doesn't allow you to access records matched other than by identity, nor does it let you see them sorted or displayed using some format other than that used for input. For any of these facilities, you must use the Design Report and Produce Report functions, which are primarily provided for printed output but which can also be used to display information on the screen.

Printed reports

The second option in the Service menu allows the user to design report formats. No reports can be printed without a predefined format, apart from direct copies of the screen display. A report

PERSONAL PEARL

may display information in exactly the same way as the record is shown on the screen, or you may design appropriate separate layouts, either from scratch or by editing a layout you have used before. The process of designing report formats is very similar to that for screen formats. Reports may be of two kinds: a Fixed report format displays one record per page, while the List report format gives one line per record plus heading infomation and the ability to display sub-totals and totals. While designing a report format, you can request that the records are produced sorted in a particular order; if the report format requests sub-totals, these are produced when the value of the first sort field (which is the most significant) changes. Fixed format reports can be produced spaced out across the page to allow the printing of address labels. Any report may be sent to the screen, to the printer or to a file; this is decided not when the report format is designed but when the production of the report is requested.

Selection

When a report is produced, one of the options is to select records which lie within certain ranges. For instance, you might want to find which of your customers had been owing you money for between one and two months; you would then request a report of all records where the 'date due' was more than a month ago but less than two months ago. To match records which are equal to a particular value, you specify the same value for both maximum and minimum. Range comparisons work with all three data types, and you can specify such selections for every field in the record if you really need to. The limitations are that you can only have one selection per field — you can't for instance, select records for people who live either in Lane Cove or Milsons Point – and all the selections are combined together so that a record is displayed only if it matches all the selections, not any one of them or some other combination. Nor can you select records which contain particular values as part of a field.

Sorting

Also at the reporting stage, you can have the records sorted on a maximum of five fields, in ascending or descending order. This is requested when the report format is produced, so you can't change it when you actually come to produce (print or display) the information. You can't sort on parts of fields.

Calculations

Calculations using addition, subtraction, multiplication and division, and parentheses, can be carried out either as part of the data input process or when preparing reports. In both cases, the calculations have to be specified when the display format is set up.

Security and integrity

There aren't any mechanisms at the moment for securing the data against unauthorised access, other than the crude method of locking up the disks, or allowing people to have only the part of Pearl that permits production of reports. You can't, for instance, allow selective updating by giving someone access only to an 'overlay' which displays names and addresses but not sensitive information like salaries. As to integrity, there is a file maintenance program which will rebuild the data dictionary if there has been some problem during file updating. This program will reset the dictionary to the point before the start of editing session, so that only a few records are likely to have been lost.

As far as file and disk security are concerned, and general housekeeping such as erasing files, the user has to rely upon CP/M commands.

Tailoring

The only tailoring supplied is the ability to select a particular terminal, and to configure Pearl for different terminals if they meet some fairly specific conditions for cursor control — the system I have previously used to run Benchtests didn't conform, but fortunately we now have a Z80 card and CP/M-80 for our Sirius and I was able to run Pearl successfully on that. Would-be users would be well advised to see Pearl working on their type of terminal before buying, just in case.

```
*************************************************************
(                                                           )
(              DESIGN                 OPERATE               )
(        1:    DESIGN FORMS        3: ENTER DATA            )
(        2:    DESIGN REPORTS      4: PRODUCE REPORTS       )
(-----------------------------------------------------------)
(Program Name: PCWBTDT                                      )
(ENTER A SERVICE NUMBER: _                                  )
(Press RETURN  to continue, ? for HELP, or ESC to EXIT      )
*************************************************************
```

Fig 1

Use with other programs

Pearl can write data out to ASCII sequential files, so you can use it to create files which Wordstar and other packages can read; you can also create Supercalc files. You can't read 'stranger' files into Pearl at the moment, so I couldn't run my Benchmarks, which rely on the ability to read a data file which is the same for all packages and which contains data stored in a 'predictable' way. My initial reaction is that Pearl in its 'special release' form is rather slow, particularly when loading and formatting — data access by keys was quick on a small file.

User image

The software is on the whole well designed for naive users, with menus, a pretty straightforward structure and lots of HELP on the screen. I particularly liked the display of special characters available for editing at each stage, though they did take up quite a lot of room — a perennial tradeoff. The user is also protected from him/herself in some quite nice ways, such as not being allowed to save records with duplicate keys where they should be unique. I felt that an expert user might find the menu structure tedious quite quickly. Also I must confess to a strong prejudice against gimmicks — such as the message 'My Pleasure' displayed when you leave Pearl!

The documentation is rather mixed. The tutorial sections displayed a remorseless thoroughness which I found a bit off-putting, but the tutorials did introduce enough features to let the user get off the ground without blinding him with detail. However, because the screens were displayed using ordinary type rather than being typeset, the manual was very bulky for what is basically quite a simple package which is fairly self-explanatory in use. Presumably the next release will remedy this defect, and also make some changes to the reference sections.

The reader was instructed firmly to go through the tutorial sections before reading these, and then given nearly as verbose an explanation of the material already covered all over again, as well as covering the more advanced features. The reference section of my manual covered more than than 40 pages, compared with nine in the pre-release version I had previously which seemed to have virtually all the same features. It did seem to be rather a case of 'never mind the quality feel the width'. I'd much rather have seen some effort put into a decent reference card covering all the options briefly, together with the ability to dispense with screen HELP when one became familiar with the commands and could get by with checking the occasional special key function on the reference card.

System requirements

Pearl needs a CP/M system with at least 48k of memory. It would be clumsy to use on a system with small disks – even

FMS SOFTWARE AND HARDWARE FOR CP/M BASED SYSTEMS

Agent for: Lifeboat Associates, Sigma International, Compuview, Westico, Memtech, Anderson Digital Equipment, AWA, Televideo, Discovery.

NEW — 16-Bit Software Available for the IBM PC, plus . . .

System Tools:
Emulator/86 (the CP/M emulator)
EM80/86
PMATE 86
UT86

Mailing List Systems:
Postmaster

Telecommunications:
ASCOM

Languages:
Lattice C Compiler

Numerical Problem-Solving Tools:

DataBase Management Systems:
T.I.M. III

Word Processing Systems and Aids:
Wordstar
Mailmerge
Microspell
Spellguard

Disk Operating Systems:
MS-DOS — soon available configured for CompuPro Sweet 17 and Software Development System. Currently available for OEM license.

Media & Formats:
IBM Personal Computer G1
GodBout. E1
Seattle E1
TecMar. E1
Victor 9000 . . . . . G3
Sirius G3

8-Bit Software Available

System Tools:
BUG and uBUG
DESPOOL
DISILOG
DISTEL
EDIT
EDIT-80
FILETRAN
IBM/CPM
MAC
MACRO-80
MINCE
PANEL
PASM
PLINK
PLINK II
PMATE
RAID
Reclaim
SID
TRS-80 Model II Cust Disk
Unlock
WordMaster
XASM 05. 09. 18. 48. 51. 65. 67. F8. 400
ZAP80
ZDT
Z80 Development Package
ZSID

Telecommunications:
ASCOM
BSTAM
BSTMS
MicroLink 80
RBTE

Languages:
ALGOL-60
APL/V80
BASIC Compiler
BASIC-80
Precision BASIC
BD Software C Compiler
CBASIC-2
CIS COBOL (Standard)
CIS COBOL (Compact)
COBOL-80
KBASIC
muLISP/mySTAR-80
Nevada COBOL
JRT Pascal
Pascal/M
Pascal/MT
Pascal/M+
Pascal/Z
PL/I-80
STIFF UPPER LISP
S-BASIC
Timin's Forth
Tiny-C
Tiny-C Two
UCSD Pascal
Whitesmith's C Compiler
XYBASIC

Disk Operating Systems:
Software BUS Family
SB-80
CP/M-80
MP/M

Language and Application Tools:
BASIC Utility Disk
DataStar
FABS
FABS II
Forms 1 for CIS COBOL
Forms 2 for CIS COBOL
MAGSAM III
MAGSAM IV
MAGSORT
M/SORT for COBOL 80
Programmer's Apprentice
PSORT
QSORT
STRING/80
STRING BIT
SUPERSORT
ULTRASORT II
VISAM

Word Processing Systems and Aids:
Benchmark
DocuMate/Plus
MicroSpell
Letterright
Magic Wand
Spellguard
TEX
Textwriter III
Wordindex
WordStar
WordStar Customization Notes

Data Management Systems:
CONDOR
Formula
HDBS
Hoe
Microseed
MDBS
MDBS DRS QRS RTL
dBASE II
PRISM/LMS
PRISM/IMS
PRISM/ADS
T.I.M. III

General Purpose Applications:
CBS
CBS Label Option
Selector III-C2
Selector IV

Mailing List Systems:
Benchmark Mailing List
Postmaster
Mailing Address
MailMerge for WordStar
NAD

Numerical Problem-Solving Tools:
T/MAKER II
fpl
PLAN80
Analyst
Microstar
muSIMP/muMATH
Statpak

Professional and Office Aids:
Angel
American Software Property Management Package
Cornwall Apartment Managment
Databook
GrafTalk
Guardian
Professional Time Accounting
Property Management
Sales Pro
Torricelli Author
Wiremaster
Univair 9000 Series Legal Time Accounting

Media & Formats
The list of available formats is subject to change without notice. If you do not see your computer listed or are uncertain, call to confirm the format code for any particular equipment.

AES SUPER PLUS IV M4
ADDS Multivision. . . . . .RT
ALSPA 8in A1
Altair 8800 . . . . . .B1
Altos A1
Apple CP/M 13 Sector . . . . .RG
Apple CP/M 16 Sector . . . . .RR
Archives 1 . . . . . .SG
AVL Eagle I R8
AVL Eagle II . . . . . .ST
BASF System 7100. . . . . .RD
Blackhawk Micropolis Mod II . .Q2
BMC IF-800 . . . . . .SR
California Computer Sys 8in. . .A1
CDS Versatile 3B Q1
CDS Versatile 4 . . . . . .Q2
Columbia Data Products 8in. . .A1
Columbia Data Products 5 25inS4
Compal 80 . . . . . .Q2
Commodore CBM/PET w/SSE Box + 8050 . . . . . .C2
Commodore CBM/PET w/Maddison Z-RAM + 8050C4
Compal 80 . . . . . .Q2
Computer Ops N C HQ. S2
Control Data 110 . . . . . .A1
CPT 8000 . . . . . .A1
Cromemco System 3 . . . . . .A1
Cromemco System 2 SD/SS . . .R6
Cromemco System 2 DD/SS. .RX
Cromemco System 2 DD/DS .RY
CSSN Backup T1
Datapoint 1550/2150 . . . . .A1
Datapoint 1550/2150 DD/SS .AA
Datapoint 1550/2150 DD/DS .AB
Datavue DU80-222 5.25in. . .M7
DECVI 18 X
Delta Systems A1
Digi-Log Microterm II . . . . .RD
Digi-Log System 2000 . . . . .RD
Digi-Log System 1000 . . . . .RD
Digi-Log System 1500 . . . . .RD
Direct OA1000 . . . . . .M2
DTC Micro 210A . . . . . .SC
Durango F-85 . . . . . .RL
Dynabyte DB8/2 . . . . . .R1
Dynabyte DB8/4 . . . . . .A1
Exidy Sorcerer + Lifeboat CP/M 80 5.25 in .RW
Exidy Sorcerer + Exidy CP/M 80 8in A1
EXO A1
Exxon 510. . . . . .M5
Exxon 520. . . . . .M5
Findex P6
Godbout (MS-DOS). E1
Heath HB + H47. . . . . .A1
Heath H89 + Magnolia CP/M 80 . . . . . .P7
Heath H89 + Heath CP/M 80 . P7
Helios II B2
Heurikon MLZ SS/DD . . . . .SN
Heurikon MLZ DS/DD . . . . .SO
Heuristics HCC Spectrum . . .A1
HP-87 5.25in 5B
Hewlett-Packard 125 5.25in. . .B1
Hewlett-Packard 125 8in. . . .A1
IBEX 7100. . . . . .RQ
IBM Personal Computer G2
ICOM2411 Micro Floppy . . .R3
ICOM3712. . . . . .A1
ICOM3812. . . . . .A1
ICOM 4511 5440 Cartridge CP/M 80 V1.4. . . . . .D1
ICOM 4511 5440 Cartridge CP/M 80 V2.X. D2
ICL PC10 . . . . . .SD
IMS 5000 . . . . . .RA
IMSAI VDP-40 . . . . . .R4
IMSAI VDP-42 . . . . . .R4
IMSAI VDP-44 . . . . . .R5
IMSAI VDP-80 . . . . . .A1
Industriel Microsystems 5000 .RA
Industrial Microsystems A1
Intel IPDS DS/DD M6
Intel MDS SD/DD. A1
Intersil Develop System A1
Inter Systems Ithaca 800. . . .A1
Intertec Superbrain DOS0.1. .R7
Intertec Superbrain DOS0.5-2x RJ
Intertec Superbrain DOS 3x. .RK
Intertec Superbrain QD . . . .RS
ISC Intecolor 8063/8360/8963A1
Kaypro S6
Lanier E 1 . . . . . .M3
Lanier Super + 4 (AES) M4
Lanier Super No problem (Lanier) M4
Lexitron VT1303 DSDD. S8
Lexor Alphasprint Model S1. . S1
Lexor Lexoriter. S1
Meca Delta 1 5.25in P6
MICOM2001. . . . . .B3
MICOM2001E. B4
MICOM3003. . . . . .M1
Micromation. A1
MicroMega 85 . . . . . .SC
Micropolis Mod I Q1
Micropolis Mod II Q2
MITS 3200-3202 . . . . . .B1
Monroe OC 8820 DD/SS. . . .SW
Morrow Discus A1
Mostek A1
MSD 5.25in . . . . . .RC
MULTI-TECH-I Q2
MULTI-TECH-II Q2
Nascom (Gemini drives) R3
Nascom II with Lucas Drives . SL
National MSC 6600. . . . . .A1
NCR81 40/9010 . . . . . .A1
NEC PC-8001 . . . . . .RV
Nicolet Logic Analyser Model 764 . . . . . .SX
NNC 80/80W A1
NNC 80 . . . . . .A1
North Star SD. P1
North Star DD. P2
North Star QD. P3
Northern Telecom 503 . . . . .SM
Nylac Micropolis Mod II Q2
Ohio Scientific C3 . . . . . .A3
OKI IF-800 + MSA CP/M 80 . SP
OKI IF 800 + OKI/Lifeboat CP/M 80 . . . . . .SR
(Above OKI entries replace catalog entry for OKI IF 800 format code RZ)
Osborne 1 5.25in . . . . . .SA
Otrona Attache . . . . . .MC
Pertec PCC 2000 . . . . . .A1
PET/CBM w/Small Systems Engineering Box + 8050 . . C2
PET/CBM w/Madison Z-RAM + 8050 . . . . . .C4
Philips MICOM 2001 8in. . . . B3
Philips MICOM 2001E B4
Philips MICOM 3003 . . . . . .M1
Philips P-2000 . . . . . .MA
Processor Technology Helios II B2
Quasar QDP100. . . . . .A1
Quay 500 . . . . . .RO
Quay 520 . . . . . .RP
Quay 900 . . . . . .A1
RAIR SD. R9
RAIR DD . . . . . .RE
Research Machines 5.25in . . .RH
Research Machines 8in A1
Senco 7000 5,25in . . . . . .RQ
Sanyo MBC 1000 . . . . . .SY
Sanyo MBC 2000 . . . . . .SS
Sanyo MBC 3000 . . . . . .A1
Seattle (16-bit) E1
SD Systems 5.25in R3
SD Systems 8in A1
Spacebyte A1
Tarbell 8in. A1
TEI 5.25in. R3
TEI 8in. A1
Televideo DD/DS Sys 1(801) . S5
Televideo DD/DS Sys 2 (806). S5
Toshiba T200 5.25in . . . . . .SF
Toshiba T250 8in. A1
Triumph Adler Alphatronic Model P2/64K. . . . . .SV
TRS-80 Model I (Standard Model) R2
TRS-80 I + FEC Freedom . . .RN
TRS-80 I + Omikron 5.25in . RM
TRS-80 Model I + Omikron 8in A1
TRS-80 Model I + Shuffleboard 8in A1
TRS-80 Model II A1
Vector MZ. Q2
Vector Systen 2800. . . . . .A1
Vector System 8/VIP. Q2
Vista V089 5.25in SD R8
Vista V200 5.25in DD P6
Wangwriter. . . . . .SE
WORDPLEX. . . . . .SZ
XEROX 820 5.25in. S6
XEROX 820 860 8in A1
ZEDA 580. . . . . .SH
Zenith Z89 + Magnolia CP/M 80 . . . . . .P7
Zenith Z89 + Zenith CP/M 80. P7
Zenith DD/SS . . . . . .SK
Zenith DD/DS. . . . . .SJ
Zilog MC22-20, 25, 50 . . . . .A1

Wordstar training guides $30 each

Note that Lifeboat programs have specific hardware and memory requirements but will run on most CP/M machines with 48KByte available.

SEND FOR FULL LIFE BOAT CATALOGUE $10

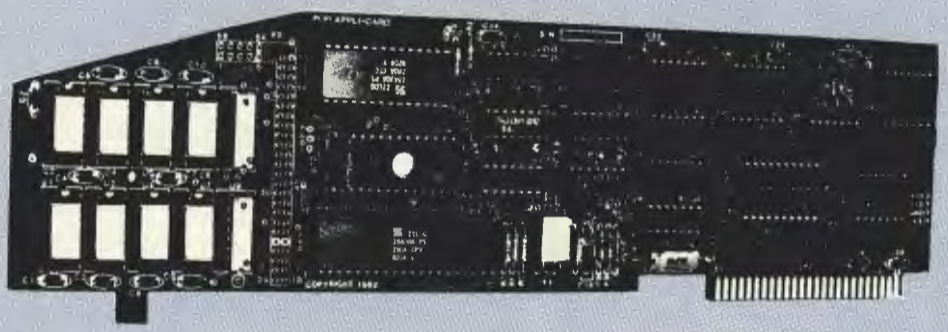
FMS 95 CANTERBURY ROAD, MIDDLE PARK, VICTORIA 3106.
Telephone: (03) 699 9899. Telex: AA 31604.

NEW. . . For Apple II & III*
from **PERSONAL COMPUTER PRODUCTS, INC.**

APPLI-CARD™

$495.00 EX TAX

4 or 6 mhz Z-80 and 64K ON-CARD MEMORY



THE ONE CARD SOLUTION TO EXECUTE CP/M* APPLICATION PROGRAMS

- Development Languages Available
- Applications Available
- Compare Our Features And Get The Best Value And Performance For Your Money.

FEATURES	Z-CARD*	SoftCard*	APPLI-CARD
6 mhz Z-80 available	No	No	Yes
64K on-card memory	No	No	Yes
CP/M with card	Yes	Yes	Yes
SB-80* available	No	No	Yes
40 col. to 255 col. horizontal scroll	No	No	Yes
Choice of application	No	No	Yes
2K PROM on the card	No	No	Yes
Real time clock available on the card	No	No	Yes
Expansion interface on the card	No	No	Yes
70 col. upper & lower case	No	No	Yes
A self-contained Z-80A or Z-80B with memory	No	No	Yes
One-card WordStar* execution	No	No	Yes
63K available for program development or execution	No	No	Yes
Menu driven set up	No	No	Yes

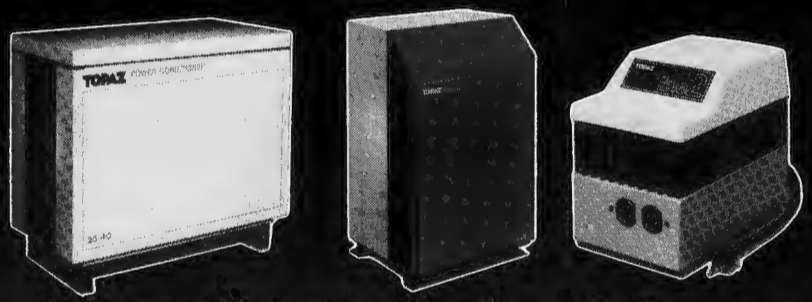
FMS SOFTWARE AND HARDWARE FOR CP/M BASED SYSTEMS

95 CANTERBURY ROAD, MIDDLE PARK, VICTORIA 3206.
Telephone: (03) 699 9899. Telex: AA31604.

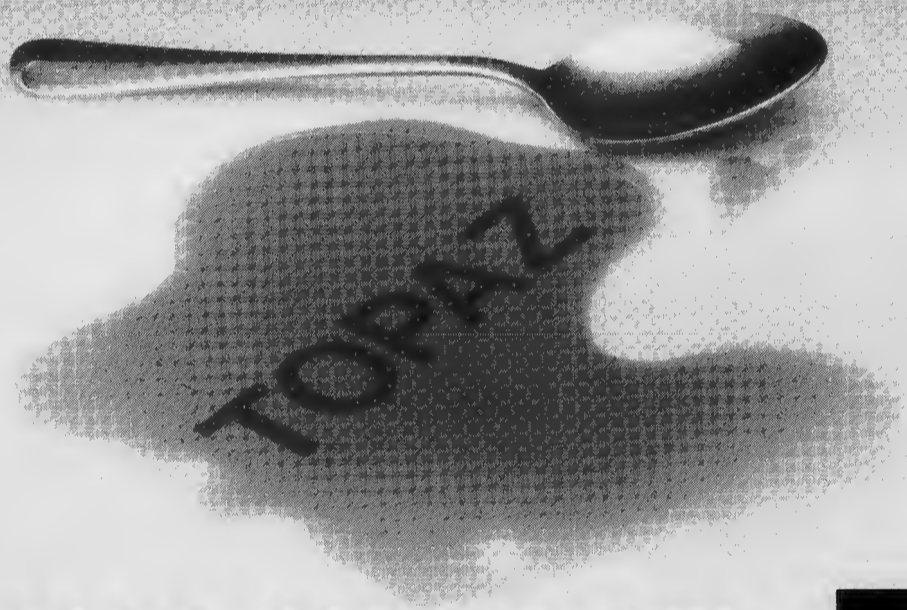
If you think your computer's sick ...

Computer problems don't always start with your computer. There are many factors affecting any computer room environment, but probably the single major difficulty lies in the power source. The new Topaz Power Conditioners have been designed specifically to protect mainframe computers from the problems of power line noise and voltage fluctuations. With wide range input/narrow band output, transient noise protection, dynamic regulation, low output impedance, brownout protection, over-voltage protection, and unmatched efficiency and economy, Topaz Power Conditioners lead the industry in AC power regulating capabilities.

So next time your computer's not 100%, it may not be the computer at all. For the right medicine, call the experts at Warburton Franki, and we'll tell you all you need to know about the Topaz range of Power Conditioners.



we've probably got the right medicine.



WARBURTON FRANKI

● ADELAIDE (08) 356-7333 ● BRISBANE (07) 52-7255 ● HOBART (002) 28-0321 ● MELBOURNE (03) 699-4999
● PERTH (09) 277-7000 ● SYDNEY (02) 648-1711 ● AUCKLAND N.Z. (09) 50-4458 ● WELLINGTON N.Z. (04) 69-3016